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The Politics of the Bullion Report¹

By FRANK WHITSON FETTER

The Bullion Report of 1810 is important to economists not because of the originality of its thought or the subtlety of its analysis, but because of its place in the history of monetary controversy. It is a symbol of a group of loosely associated ideas that might be described in general terms as the tenets of pre-1914 monetary orthodoxy. The core of these ideas was that the credit policy of a central bank is the major influence on a country's prices and exchange rates, and that the central bank's discretion in credit policy is limited by the overriding importance of maintaining a fixed price of gold.

Succeeding generations of economists have given different interpretations to the analysis of the Bullion Report, and to the motives of its authors and supporters. In the late nineteenth and early twentieth century the Report was generally praised as inspired wisdom of original and powerful analysts and far-sighted economic statesmen, but in the 1920's it came to be pictured as special pleading by Ricardo, as a financial manipulator, and by political obstructionists, who would have sacrificed the financial greatness and national safety of England to their economic and partisan interests. Both extremes of interpretation reflect to a large degree the prevailing economic philosophy and the international economic situation of the period when they had their greatest vogue; both are coloured by a common error of attributing to Ricardo a role, either for good or for evil, much more important than he played in producing the Bullion Report; and both to a large degree are made without due regard to the complex of forces that led to the Report, and that supported or opposed it after its publication.

In the controversy of 1810 and 1811 the principal theoretical analysis of the Report, that monetary policy could control exchange rates, was repudiated by Parliament, and the recommendation for a resumption of specie payments in two years was rejected. With the return to peace the analysis and recommendation of the Report were accepted in the Resumption Act of 1819, and in the formal recognition by the Bank of England in 1827 of its power to control exchange rates.² The result was that for the better part of a century after the 1820's the analysis and policy conclusions of the Bullion Report were in the

¹ The material for this article was collected as part of a study of the British monetary and banking controversy in the first part of the nineteenth century, for which I received aid from the Committee on Research Funds of the Graduate School of Northwestern University, and from the Ford Foundation.

² See J. K. Horsefield, "The Bankers and the Bullionists in 1819," *The Journal of Political Economy*, vol. LVII, October 1949, pp. 442-448.

main stream of economic thought. Furthermore, from John Stuart Mill to the 1920's the general practice was to lump together all English economics in the first quarter of the nineteenth century under the title Ricardian, and this discouraged a critical examination of just what had gone into the framing of the Bullion Report. Almost the only pre-1914 writer to present in any organized way the background of the theory of the Bullion Report was Jacob Hollander,¹ but even his work did little to clarify the political setting of the Report, and conveyed the impression of a much closer connection than had in fact existed between Ricardo's theory and the theory of the Bullion Report. And finally, the prevailing idea in the heyday of economic liberalism of a sharp division between economics and politics meant that few economists bothered to set the Bullion Report in its political background. The result was that the Bullion Report had by 1914 become part of economic theology, surrounded by a haze of historical mythology.

This view of the Bullion Report was, by World War I, long overdue for critical reappraisal, and revisionism found an articulate and extreme spokesman in Norman J. Silberling.² Silberling's views have been frequently cited by others in support of the idea that the Bullion Report was the product of Ricardo's self-interest and the desire of Whigs to embarrass the Tory Government, and that the adoption of the Report's recommendation would have crippled Britain's war activities or even have brought the end of the British Empire.³

The Silberling thesis had three main points:

(a) The Bullion Report failed to give sufficient attention to non-monetary influences on the exchanges.

(b) Ricardo's participation in this monetary controversy is explained in large part by his economic self-interest as a speculator in government bonds, and he was instrumental in bringing about the appointment of the Bullion Committee and had a great influence on the doctrines in its Report.

(c) The recommendations of the Report and its Parliamentary support were marked by irresponsible action by opponents of the Tory Government that was engaged in a death struggle with Napoleon.

Silberling's presentation, entirely aside from its factual accuracy or the merits of its analysis, was in full accord with the spirit of the 1920's. The war experience had made economists more aware of non-monetary influences on exchange rates, and had shaken the belief that specie payments could or should be maintained under all

¹ "The Development of the Theory of Money from Adam Smith to David Ricardo," *The Quarterly Journal of Economics*, vol. XXV, May 1911, pp. 429-470.

² "Financial and Monetary Policy of Great Britain during the Napoleonic Wars," *The Quarterly Journal of Economics*, vol. XXXVIII, May 1924, pp. 397-439.

³ A notable example of the influence of Silberling's interpretation is in Sir John Clapham, *The Bank of England* (Cambridge, 1945), vol. II, pp. 22-29.

circumstances. The sordid interpretation of Ricardo's role was in line with the general attitude of the post-war years. I am not concerned here with Silberling's analysis of the theory of the Bullion Report, beyond the general statement that in his desire to build up a case against Ricardo he failed to recognize the important theoretical differences between Ricardo's analysis and the analysis of the Bullion Report. Viner, over twenty years ago,¹ covered Silberling's theory in detail, and among others the writings of Hayek,² Sayers,³ and Will Mason⁴ have sharpened our understanding of the theoretical issues raised by the Bullion controversy. In the field of theory the net effect of revisionism has been for the better. But on the second and third aspects of revisionism—Ricardo's role, and the political motivations of the backers of the Bullion Report—the result was to leave a less accurate picture than had existed before.

On the matter of Ricardo's relation to the Bullion Report Silberling, and also Angell⁵ and Clapham, took over, and if anything strengthened the earlier view that Ricardo had a dominant influence on the Bullion Report.⁶ Silberling compounded this error by his idea that Ricardo's economic interest in forcing down the price of government stocks explained his supposed agitation for the appointment of the Bullion Committee. The Silberling thesis that Ricardo was trying to drive down the price of government bonds was supported by extremely questionable evidence, and its continuing widespread popularity⁷ can only be explained on the assumption that in the disillusionment of the inter-war years there was a receptive audience, even in the absence of evidence, for the most cynical version of an economic interpretation of the development of economic theory. Sraffa, in his discussion, *A Canard*, in the chapter "Ricardo in Business",⁸ has presented a conclusive case against this Silberling thesis and nothing remains for others to say.

¹ *Studies in the Theory of International Trade* (New York, 1937), pp. 119-170.

² Introduction to reprint of Henry Thornton's *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain* (New York, 1939).

³ "Ricardo's Views on Monetary Questions," *The Quarterly Journal of Economics*, vol. LXVII, February 1953, pp. 30-49, and reprinted in T. S. Ashton and R. S. Sayers, *Papers in English Monetary History* (Oxford, 1953), pp. 76-95.

⁴ "Some Neglected Contributions to the Theory of International Transfers," *The Journal of Political Economy*, vol. LXIII, December 1955, pp. 529-535.

⁵ "Ricardo's Transfer-Mechanism Theory," *The Quarterly Journal of Economics*, vol. LXXI, February 1957, pp. 107-115.

⁶ *The Theory of International Prices* (Cambridge, 1926), pp. 54-65.

⁷ In "The Bullion Report Re-examined," *The Quarterly Journal of Economics*, vol. LVI, August 1942, pp. 655-665, I give the evidence that Ricardo had little influence on the Bullion Report, and that the popular belief that he did have an important influence is based in large part on the fact that after its appearance he was a champion of its policy conclusions even though he disagreed with some of the analysis. This article is reprinted in T. S. Ashton and R. S. Sayers, *op. cit.*, pp. 66-75.

⁸ As late as 1945 Clapham cited Silberling on Ricardo's economic interest in a restriction of credit that would bring down the price of bonds in which he was supposed to have taken a bear position. *Op. cit.*, vol. II, p. 23.

⁹ *Works and Correspondence of David Ricardo* (Cambridge, 1955), vol. X, pp. 91-94.

But the third question unloosed by revisionism, as to the motives of the men who sponsored the Bullion Report and who supported it, and the reasons why the Government and the Bank took so decided a stand against the Report, is still not fully answered. Seventeen years ago I attempted to reinterpret the Report in relation to the economic issues and the political situation of its time.¹ Since 1942 the availability of additional material in the Ricardo *Works*, and an opportunity to examine manuscripts, hitherto unworked by economists, bearing on the Bullion controversy, makes possible a further survey of the political setting of the Report and of the controversy that it provoked. The full story of this landmark in monetary controversy is significant not only for its own sake, but because it may also help to provide a better perspective for the interpretation of other great issues of economic policy. And as a by-product it may add a footnote to political history.

On February 27, 1797, the Bank of England, under an Order in Council, suspended specie payments as the result of a run that, following rumours of a French invasion, had started in Newcastle the previous week. In the Parliamentary debate of 1797 over continuation of the Order in Council, some Whigs criticised the Government's action and prophesied that the Bank of England note would soon go the way of the *assignat*. Most of these critics had been opponents of the Pitt policy toward France, but only in a very loose and general sense was monetary policy a party issue in 1797. In any case there was only a brief flurry of controversy, and there was no immediate depreciation of the inconvertible paper. However, late in 1799 the Bank of England note, whether measured by the price of gold and silver, or by exchange rates on Hamburg and Lisbon, became less valuable, and by the middle of 1800 the depreciation was about 10 per cent.²

This situation provoked, early in 1801, the first extended discussion since 1797 of the relation between Bank of England policy and fluctuations in exchange rates and specie prices: Walter Boyd's *Letter to the Right Honourable William Pitt on the Influence of the Stoppage of Issues in Specie at the Bank of England*. Boyd was a member of Parliament, and a loan contractor who had been denied credits by the Bank and had failed in 1800. His presentation, marked more by vigour of statement than by refinement of analysis, placed the responsibility for the developments in the foreign exchanges and the specie market upon the increase in note issues of the Bank of England. By the middle of 1802 the price of specie and of foreign exchange had come much closer to pre-Restriction figures, and the controversy raised by Boyd's pamphlet soon died down. Parliamentary repercussions were limited to a few sputterings. In 1802 and early 1803 the monetary and banking literature was desultory, with one notable exception.

¹ "The Bullion Report Re-examined," *loc. cit.*

² This figure and all figures cited on specie prices and the exchanges are taken from Appendix 14 of *Second Report from the Secret Committee on the Expediency of the Bank Resuming Cash Payments* (Commons Committee of 1819).

Henry Thornton's *An Enquiry into The Nature and Effects of the Paper Credit of Great Britain*, although appearing after the controversy raised by Boyd had subsided, had a number of references to Boyd's book, and was critical of Boyd's explanation that the expansion of note issue of the Bank of England was the sole cause of the difficulties. The argument of Thornton's book reached a much larger audience through the extended review that Francis Horner published in the first issue of the *Edinburgh Review* in October 1802.

It was not until well into 1809 that the rise in the price of specie and the fall in the foreign exchange value of the Bank note revived the controversy over the credit policy of the Bank of England. But in the meantime, while the Bank of England note was within a few per cent. of the pre-Restriction relation to specie and the continental exchanges, the Dublin-London rate was becoming increasingly unfavourable to Dublin; and by the spring of 1803 the Bank of Ireland note, also inconvertible since 1797, was at a discount of nearly 10 per cent. in relation to the Bank of England note. This produced a Parliamentary debate in May 1803, in which Lord King made a speech that became the basis of his widely read pamphlet, *Thoughts on the Restriction of Payments in Specie at the Banks of England and Ireland*. There were a number of other pamphlets, and the Parliamentary discussion led to the appointment in 1804 of a Committee to investigate the condition of the Irish currency and the exchange between Ireland and England. In the pamphlets and in the Report of the Committee¹ the theory of the foreign exchanges was explored with greater thoroughness than in the 1801-1802 controversy. A large part of the theory of the influence of a central bank on the ability of other banks in the system to expand credit, and of the relation between monetary and non-monetary influences on the exchanges, that later appeared in the Bullion Report, was stated in the Irish Report. Six of the members of the Irish Committee were also members of the Bullion Committee, and one of these, Henry Thornton, was a leader in the work of both committees. Furthermore, Francis Horner, though not yet in Parliament, evidently followed closely the activities of the Committee and possibly had some influence on the members of the Committee and on the Report.² The Committee's Report, however, was in the

¹ The Report is republished in my monograph, *The Irish Pound* (London and Evanston, 1955), pp. 65-87. The Introduction, and in particular pp. 24-48, discusses the background and analysis of the Report. A bibliography, pp. 125-127, lists 18 items in the years 1803-1805 dealing with the Irish exchange.

² See *The Irish Pound*, p. 30, for a letter of Horner's that speaks of Thornton's work on the Committee, and indicates Horner's interest in and contact with the work of the Committee. Further evidence of Thornton's activity on the Committee is his letter of March 17, 1804 to Hannah More:

I have since got upon an Irish paper currency Comm^{ee} which lasts long and occupies us 4 days a week. I am so much at home on that subject that I fancy myself more useful in my capacity of a Committee man than as a man having a vote in the House, and I would therefore not decline serving.

A copy of this letter, and of the letters of Thornton and of Mrs. Thornton quoted later, are in the possession of Thornton's great grandson, Mr. E. M. Forster, of King's College, Cambridge, through whose courtesy I was able to consult them.

nature of an anti-climax for by the time that it appeared in May 1804 the Irish currency had improved appreciably, and by the first part of January 1805 its discount in terms of the Bank of England note was barely 1 per cent.

For about five years after the publication of the Irish Report the foreign exchanges, the price of specie, and the policy of the Bank of England were dead issues, if one can judge from the almost complete absence of discussion in Parliament, in the press, and in pamphlet literature. Then, early in 1809, there was a sharp rise in the paper price of gold and silver and a fall in the value of the paper pound on the European exchanges.¹ In this situation Ricardo, who had played no part in the controversy of 1801-1804, but whose thinking unquestionably was influenced by the ideas that emerged from that controversy,² wrote the first of his three letters on "The Price of Gold" to the *Morning Chronicle*, whose publication on August 29, 1809 launched his career as an economist. These letters were followed about four months later by *The High Price of Bullion, A Proof of the Depreciation of Bank Notes*.³ There was nothing here that had not been said many times in the setting of 1801-1804. And as theory it was much inferior to what was in Thornton, Horner, and the Irish Currency Report, for it placed the entire responsibility for the disturbance in the markets for foreign exchange and bullion on the Bank of England, with no recognition, as in these earlier writings, of the possible influence of non-monetary disturbances. Contemporary evidence that Ricardo was not considered to have expressed any new ideas is the review, in general quite favourable to Ricardo, of his *High Price of Bullion* in the *Quarterly Review* of February, 1810:⁴

He has only given a statement of those sound and orthodox doctrines respecting the effects of a superabundant paper-circulation, which are now beginning to be generally received; and his statement has the recommendation of just about as much novelty as an acknowledged doctrine may be expected to contract in passing through a thinking and ingenious mind.

But in the setting of 1809 it is true that Ricardo was the first person to raise publicly in an organized way the

¹ In October 1805 the price of foreign gold coins was £4-0-0 an oz., a premium of barely 3 per cent. over the mint price. Between then and February 1809 there is no recorded gold price, but in that month and the following month foreign gold was quoted at £4-10-0, and in April and May at £4-11-0. The £, that was worth over 35 Hamburg shillings (a silver currency) throughout most of 1804 and 1805, and had been around 34 shillings up to September 1808, fell below 30 shillings in May 1809 and below 29 shillings in July.

² Evidence of this earlier controversy in the development of Ricardo's thought is found in the references in *The High Price of Bullion* to the writings of King and Thornton and to Horner's reviews of those works in the *Edinburgh Review*.

³ The Introduction is dated December 1, 1809, but it was not published until the last week in 1809 or the first week in 1810. See *Works*, vol. III, pp. 3-12 for details on the circumstances and dating of these and the other publications of Ricardo on the Bullion controversy.

⁴ Vol. III, Article xii, p. 156. The article was probably written by William Greenfield.

problems that the Bullion Committee investigated the following year.¹

Ricardo's letters touched off a number of letters and articles in the *Morning Chronicle*, as well as in other papers, but the only other pamphlets on the subject to appear previous to the appointment of the Bullion Committee were Robert Mushet's *An Enquiry into the Effects Produced on the National Currency and Rates of Exchange, by the Bank Restriction Bill*; and the anonymous *The Real Cause of the Depreciation of the National Currency Explained*, attributed to Peter Carey. Parliamentary discussion of the problem started on February 1, 1810, when Horner² moved "for a variety of accounts and returns respecting the present state of the circulating medium, and the bullion trade", and stated that he intended later to move for the appointment of a Committee to investigate the problem. Unlike Ricardo, Horner did not attribute the situation solely to monetary conditions, and stated that he was uncertain to what extent the depreciation was due to monetary expansion and to what extent to "new circumstances in which the foreign trade of this country was placed". In the brief debate that followed there was no opposition to Horner's motion, which was simply a request for information, and Spencer Perceval, the Prime Minister and Chancellor of the Exchequer, supported the motion.

It is part of the folklore of economics, which like all long accepted folklore dies hard, that Ricardo's ideas not only were the doctrine of the Bullion Report, but that his writings and particularly his influence on Horner were responsible for the appointment of the Bullion Committee. Nothing illustrates better the groundlessness of these traditional beliefs than does Ricardo's letter of February 5, 1810 to Horner,³ prompted by Horner's remarks in introducing his resolution of February 1. There is not the slightest hint that Ricardo had anything to do with the motion. It was not in praise, but in criticism that he wrote to Horner. The whole tone of the letter was that of correcting Horner's statements, erroneous in Ricardo's eyes, that had suggested that the high price of gold was due to causes other than "the superabundance of the paper currency".

. . . I beg leave to differ from you and further to trouble you with my reasons for so doing. . . . It appears then to me, that no point can be more satisfactorily established, than that the excess of the market above the mint price of gold bullion, is, at present, wholly, and solely, owing to the too abundant quantity of paper circulation. . . . I shall now proceed, Sir, in endeavouring to prove that the other causes which you assign for an excess of the market above the mint price of gold, are insufficient and could in no case produce such an effect.

¹ A search in the London newspapers of the summer of 1809 failed to turn up any discussion, before Ricardo's letter of August 29, of the causes of the exchange and bullion situation, other than an editorial in the *Morning Chronicle* of July 25 that referred to the depreciation of the £ following the drawing on England by the Austrian Government and suggested that an increase in paper money might make the situation worse.

² *Hansard*, First Series, vol. XV, 269. ³ *Works*, vol. VI, pp. 1-7.

On February 19, 1810, Horner moved for a Select Committee "to enquire into the Cause of the High Price of Gold Bullion", and the motion was approved without debate and the Committee appointed.¹ Horner was a Whig, but there was no suggestion, either at the time that he moved for the Committee or during its hearings, that there was any partisanship connected with the appointment of the Committee or in the selection of its 22 members: seven were clearly identified as Tories, seven as Whigs, and eight, including Thornton and Alexander Baring, were either independents, or had only nominal party affiliations.² The two members, other than Horner, who played the most important role in the work of the Committee and in drafting its Report were Thornton, an independent who had generally supported Pitt's policy and was thought of at the time as a defender of the Bank Restriction;³ and Huskisson, a Tory associated with the Canning group of the party, and who had been a member of the Government for several years up to 1809 but was out of office at the moment.

The position of Thornton and Huskisson in the Bullion Committee and in their subsequent defence of its Report was taken more in sorrow than in partisanship. It was the outgrowth of their increasing concern over the apathy of the Government and the Bank about the condition of the foreign exchanges and the bullion market, and over the support by the Bank and Government spokesmen for the "real bills" doctrine in its most extreme form: i.e., that as long as the Bank's advances were made only on sound commercial assets the amount of the advances could have no effect on prices or the foreign exchanges. In this connection the letter of May 30, 1810 from Mrs. Henry Thornton to Hannah More is suggestive of the approach of Thornton to the problem:

Of Mr. T. and his Committee I cannot tell you much except that I extremely regret that he is little in his fragrant sheltered garden, where even in these east winds he can dig most comfortably. He is kept in town two or three nights a week by the lateness of the hour. When you think of your old friend in the guise of an oppositionist, pray recollect that he imparts to it all his characteristic mildness and candour, and then I assure you the mixture is not a bad one.

¹ *Hansard* has no reference to the action of February 19, which probably explains the view, found in several authors, that the Committee was appointed on February 1. *The Times* of February 20 carried the story of Horner's motion of the previous day and the text of the Resolution, and the appointment of the Committee and its membership is recorded in the *Journals of the House of Commons*, February 19, 1810, p. 105.

² See Appendix.

³ The *Quarterly Review*, *loc. cit.*, p. 154, spoke of "Mr. Thornton, the great champion of the Bank-restriction bill, . . . ; and Mushet, writing shortly before the appointment of the Committee, said "that the arguments of Mr. Henry Thornton, and all those who advocated the cause of the Restriction Bill, and its policy, possess no real foundation in truth," *op. cit.*, p. 51.

Further evidence that Thornton was thought of as friendly to the Bank Restriction is a letter of Sept. 27, 1810 from Henry Beeke to J. C. Herries, criticizing the Report, in which he asked: "Is it possible that Henry Thornton could sit quiet and allow a Report to appear of such a complexion?" (Manuscript belonging to Lt. Col. G. Spottiswoode, that I consulted at the National Register of Archives).

Twelve years later, in a debate on monetary policy, Huskisson said of his action in 1810:¹

In my opinions upon the subject, it was my misfortune, in 1810, to differ from some distinguished members of this House to whom I was personally attached, and in whose political views I had generally concurred; but having formed these opinions deliberately and conscientiously, I could not honestly withhold them from the public.

The Report was approved by the Committee by a vote of approximately 13 to 6.² Of the six voting against the Report, four—John Irving, Charles Long (Paymaster General), William Manning (Deputy-Governor of the Bank), Spencer Perceval (Prime Minister and Chancellor of the Exchequer)—were Tories; and Thomas Thompson and Alexander Baring were independents with Whig leanings at that time. Of the thirteen supporters of the Report, six were avowed Whigs, and one of these, Pascoe Grenfell, was a large stockholder in the Bank of England; six were independents, some of whom had frequently voted with the Government in important issues; and Huskisson was an avowed Tory.

The Report was both a statement of the theory of the foreign exchanges and a policy recommendation. Motives are mixed in such a situation, and it is clear in the case of Thornton, and probably also of Huskisson, that they were willing to support a policy recommendation about which they had serious doubts—resumption in two years even if the country were still at war—as a protest against what they considered the dangerous monetary theory of the Bank and the Government. On the other hand, Alexander Baring voted against a Report with whose monetary theory he was in substantial agreement, because he felt that the policy recommendations were dangerous in the setting of the war.

Horner submitted the Report to the Commons on June 8, 1810, and although *Hansard* does not report his speech, the *Morning Post* and *Morning Chronicle* of June 9 quote him as saying that the Report "was unmixed with any party consideration whatever". It was not printed until August 12, 1810, but in the interim of over two months the main contents of the Report must have been public property. On June 11 an editorial in the *Morning Chronicle* stated that the Report recommended a resumption of cash payments in two years,

¹ *Hansard*, Second Series, vol. VII, p. 897, June 11, 1822.

² J. C. Colquhoun, in *William Wilberforce: His Friends and His Times* (London, 1866), speaks of "long deliberations in the Bullion Committee in which Horner and Henry Thornton carried their motions against the Government 11 to 4" (p. 301). Thornton, in an undated letter written shortly after May 30, said: "We carried our question in the Committee by about 12 to 4 for making the Bank open in two years".

A letter in the *Morning Chronicle* of October 15, 1810, signed A.B., gives the names of thirteen members voting for the Report and five members voting against it, in addition to Alexander Baring who spoke "for" but voted "against" the Report. Three members were absent at the time of the vote. The letter is republished in the Ricardo, *Works*, vol. iv, pp. 417-418.

and the *Morning Post* gave the same information in a news item the following day. Between June 8 and August 12 I find no suggestion in the press, in pamphlets, or in Parliament, which was in session until June 21, that the Report had been inspired by partisanship, or that it was in any way responsible for the commercial difficulties and increased bankruptcies in June, July and August of 1810, which Silberling and others have since attributed to it.¹

After the release of printed copies on August 12, long extracts from the Report appeared in the London press. Not only was there no hostile comment in the *Sun*, the most strongly Tory of the evening papers, but the two leading Tory morning papers, the *Morning Post* and the *Morning Herald*, as well as *The Times*, which was usually a supporter of the Government, commented favourably on the Report.

Unpublished manuscript material,² when checked with contemporary published material, indicates that some time late in August or early

¹ Silberling says: (*loc. cit.*, p. 437) "The most important immediate effect of the Report, at any rate, was to create a general fear of abrupt and arbitrary deflation, which contributed to precipitating, in 1810 and 1811, one of the most desperate commercial revulsions and financial panics ever known in England."

Alexander Brady, in *William Huskisson and Liberal Reform* (Oxford, 1928), p. 26, outdoes Silberling in his reporting of the immediate consequences of the Report: "The committee's conclusions came to bankers and merchants like a thunderbolt. The prospect of any tinkering with the currency violently disturbed a war-strained public, and deflation was dreaded as a thing of evil. A number of mercantile houses in London failed. Others were brought to the brink of collapse."

In more restrained language, Clapham (*op. cit.*, vol. II, p. 29) also suggests that the Report had been responsible for the failures of June and July 1810: "The very issue of their Report, followed as it was almost at once by the failure of 'several houses of the first respectability' [a phrase that Clapham quotes from *The Monthly Commercial Report* of Aug. 1, 1810, on the authority of Thomas Tooke], had made bankers tighten their purse strings and had forced still more borrowers on to the Bank."

Between May 1810 and August 1811 monthly bankruptcies were well above bankruptcies in 1809 and the first four months of 1810, but the speculative excesses of 1809 and early 1810 would be adequate explanation for the bankruptcies of the second half of 1810. Furthermore, when the monthly bankruptcy figures are related either to the date on which the text of the Report was presented to Parliament (June 8), or the date when it was printed (August 12), it requires a strained interpretation to connect public knowledge of the Report with increased failures, for both June and August had less failures than the preceding month, and failures did not hit their high until the last two months of the year.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Failures	96	126	122	87	162	102	192	123	109	166	285	229

(Total)

Failures

(Seasonally

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
adjusted)	88	108	116	84	144	104	213	146	179	208	210	218

These figures are from Tables 214 and 215 of the microfilm data listed in the Appendix of Arthur D. Gayer, W. W. Rostow, and Anna Jacobson Schwartz, *The Growth and Fluctuation of the British Economy* (Oxford, 1953). The microfilm is available at University Microfilms, Ann Arbor, Michigan. The unadjusted figures were compiled from bankruptcy reports in the *London Gazette*, and the seasonal adjustments were made by the authors.

² The principal MS. material used were the papers of J. C. Herries, belonging to Lt. Col. G. Spottiswoode, and papers of Spencer Perceval belonging to Mr. Dudley Perceval, both on deposit at the National Register of Archives; and additional Perceval papers in the possession of Mr. David Holland, through whose courtesy I was able to consult them.

in September a decision was reached by the Government and the Bank to launch an all-out attack on the Report. Four men played a leading part in the behind-the-scenes campaign against the Bullion Report:

Sir Francis D'Ivernois, a Genevese refugee who for some years had been a confidential adviser to the British Government on matters relating to France, and a British secret agent on the Continent. He had close relations with Nicholas Vansittart, who had been Joint Secretary of the Treasury, and in 1811 was the principal Parliamentary critic of the Bullion Report. D'Ivernois had been knighted in 1796, and since 1800 had been receiving a pension of at least £500 a year from the British Government.¹

Henry Beeke, professor of modern history at Oxford, author of a pamphlet of 1799 on the income tax, friend of Nicholas Vansittart, and a behind-the-scenes adviser of Tory politicians.

John C. Herries, at the time Secretary to Nicholas Vansittart, Prime Minister and Chancellor of the Exchequer. He was then and for many years thereafter a financial adviser of Tory leaders, and Chancellor of the Exchequer for a brief period in 1827.

Jasper Atkinson, a man of mystery about whom practically nothing is known beyond the fact that for a period of over 25 years he wrote pamphlets, generally in support of Government and Bank policy, and that he enjoyed the confidence of people associated with the Government and had some sort of connection with the Bank.² Between 1802 and 1829 Atkinson is known to have written at least thirteen pamphlets, some anonymous, of which the most familiar to economists are the anonymous *Considerations on the Propriety of the Bank of England Resuming its Payments in Specie* (1802), and *A Letter to a Member of Parliament; occasioned by the Publication of the Report from the Select Committee on the High Price of Gold Bullion* (1810). He was not Sir Jasper Atkinson

¹ A full account of D'Ivernois' activities in England is given in Otto Karmin, *Sir Francis D'Ivernois, 1757-1842* (Geneva, 1920). This volume publishes (pp. 470-472) from a copy in the Geneva Archives, part of the French version of a memorandum on the Bullion Report prepared for Perceval, of which an English version is in the Herries papers, cited below, pp. 110-111.

² A letter of July 1, 1798 from Atkinson to Huskisson in regard to a loan that a "Mr. Boyd"—presumably Walter Boyd—was seeking from the Bank, and the draft of a reply by Huskisson (British Museum, Add MS. 38735, ff. 87, 88) reads as though Atkinson were in the Bank, but the Bank has no record of a Jasper Atkinson's connection with the Bank. The only Jasper Atkinson who was a stockholder in the early years of the century died before March 1810. In 1815, apparently on behalf of the Bank, he acted as an intermediary between the Bank, Pascoe Grenfell, Beeke as adviser to Vansittart, and Vansittart, in regard to Grenfell's proposed resolution on the Bank's profits. (Beeke's letter to Vansittart, April 15, 1815. British Museum Add MS., 31231, ff. 261-263). These resolutions led to an extended correspondence between Grenfell and Ricardo (*Works*, vol. VI, *passim*) and were the occasion for Ricardo writing *Proposals for an Economical and Secure Currency* (editorial note in Ricardo, *Works*, vol. IV, pp. 45-48).

In the Kress Collection at Harvard is a volume of clippings and notes covering the period 1790-1825, and bearing the book-plate of Jasper Atkinson. The volume almost certainly belonged to the Jasper Atkinson of the Bullion controversy, on the basis both of handwriting and the fact that some sentences in memoranda are identical with sentences in the published pamphlets of Jasper Atkinson. The material indicates wide knowledge of domestic and international economic problems, particularly of the Dutch Trade, and some entries suggest inside information on the affairs of the Government and of the Bank of England.

(1790–1856), a Provost of the Royal Mint, with whom he is sometimes confused. A variety of circumstantial evidence makes it almost certain that the Jasper Atkinson who at the time of his marriage in 1791 was described as “of Aldermanbury, banker”; the Jasper Atkinson who died at The Cottage, near Maidenhead, Berks., on January 30, 1844, at the age of 83; and the Jasper Atkinson of the Bullion controversy, were all the same person. There is also evidence, though by no means conclusive, to suggest that the Jasper Atkinson of the Bullion controversy was active in trade with Holland, and that he was the Jasper Atkinson, the Younger, of Aldermanbury, who was declared bankrupt in 1800.

Atkinson, with the help of Beeke, who apparently had also assisted Atkinson with pamphlets in 1802, and with Herries’ knowledge and possibly at his instigation, was engaged in early September in preparing an answer to the Bullion Report.¹ Beeke’s comment in regard to Atkinson adds to the mystery of Atkinson’s role in the Bullion controversy:

I know few men better qualified than he is to explain the nature of the Questions before the Bullion Committee both from Talents & Knowledge, although there are reasons why he cannot properly be called as a Witness.

D’Ivernois not only visited Beeke, probably while Atkinson was with Beeke, but also visited another country residence where hatchets were being sharpened against the Bullion Report, for he wrote to Herries on September 26:

Je viens de passer ces dix jours dans deux maisons de campagne où l’on prépare déjà deux réponses au Rapport de votre fameux Comité.

At the same time D’Ivernois, both in letters to Herries, and in an undated memorandum in the Herries papers probably prepared early in 1811 and which contains many ideas in the earlier letters to Herries, developed with great emphasis, but on very slender evidence, the thesis that the publication of the Bullion Report had been a serious diplomatic setback for Great Britain. Aside from a general accusation that the authors of the Report had “committed a most grievous and deplorable fault in putting such a Weapon into the hands of the Enemies of their Country”, D’Ivernois charged specifically that as a result of the publication of the Report:

(1) Napoleon had given up his intention to repeal the Berlin and Milan decrees and “reverted to those Decrees, strengthening them by such rigorous measures as will render them a great deal more effectual”.

(2) The American Government “in their official Dispatch of the 19th October,² have all of a sudden assumed such a haughty and

¹ Letters of Sept. 10 and 27 from Beeke to Herries. An example of the political ramifications of Beeke’s literary services for the Government is a letter that he wrote to Herries earlier in the year, telling him that he wished to be Dean of Canterbury, and that he had taken the professorship simply to keep someone else from getting the position and would like to give it up as soon as possible.

² I find no record of any dispatch of October 19, 1810 from the American Government to the British Government, but instructions of that date from Robert Smith, Secretary of State to Pinckney, the American Ambassador, authorized him to

peremptory tone toward Great Britain. This certainly is no more than was to be expected. Why should they not endeavour to take advantage of a Parliamentary Document which affords such incontrovertible proofs that, in the actual state of Things, an exclusion from their Markets would inflict a deadly wound on British Trade”.

A tempting hypothesis, that, however, has only circumstantial evidence to support it, is that D'Ivernois' charge that the Bullion Report was responsible for Napoleon's tightening of the commercial restrictions against England is explained by his desire to justify to the British Government the failure of his predictions around the beginning of 1810 that Napoleon had intended to relax or repeal the Berlin and Milan decrees. Regardless of the accuracy of D'Ivernois' charges in this memorandum, they appear to have coloured the Government's approach to the controversy, and some of the statements made by Castlereagh and Vansittart in the Parliamentary debates of May and June 1811 reflect this claim that the Bullion Report had attracted much attention on the Continent and in the United States to the disadvantage of Great Britain.¹ Much of Silberling's discussion of the Report, and even indirectly the general attitude of Clapham toward the Report, trace back to the ideas that D'Ivernois expressed.

Even before there is any evidence that people close to the Government were organizing an attack on the Bullion Report, Sir John Sinclair, the President of the Board of Agriculture, started an agitation against

take a stiff attitude on American maritime rights. This message was transmitted to Congress by President Madison on December 5, 1810 (American State Papers, Foreign Relations, vol. III, Washington, 1832, p. 369).

It is undoubtedly this message to which D'Ivernois refers. I find no suggestion, however, in any American diplomatic history that the position taken by the American Government in late 1810 was in any way affected by the publication of the Bullion Report. My colleague at Northwestern, Professor Richard Leopold, a specialist in American diplomatic history, confirms me in the belief that D'Ivernois' suggestion about American foreign policy is most unlikely.

¹ Castlereagh took this view (*Hansard*, New Series, vol. XIX, 1009, May 7, 1811); and Vansittart (*ibid.*, vol. XX, 4, May 13, 1811) said that the publication of the Report had “produced effects not beneficial but injurious to this country. For what other purpose has it been translated, circulated, and commented upon by the partizans of France in every country in Europe? What other use has been made of it in America?”

A search in the British diplomatic dispatches from the Continent in late 1810 and 1811 failed to reveal evidence of any foreign repercussions of the Bullion Report that were thought worthwhile reporting to London. Professor E. F. Söderlund of the University of Stockholm, who is thoroughly familiar with the economic relations of Sweden and England in this period, tells me that he knows of no suggestion in Sweden at this time that the Report was used against England.

I can find nothing in the Paris papers in late 1810 to suggest that the French were elated over the Bullion Report, as Silberling argued (*loc. cit.*, p. 437) and his interpretation of a passage in the *Journal de l'Empire* of September 4, 1811, is a forced one. The Count de Montgaillard's book, published in Paris in October 1811, reputedly under French government sponsorship, mentions the Bullion Report only to say that in its comments on British currency and finance “the unfavourable side is softened down, while the favourable one is highly coloured” (From London translation of 1812 under the title, *The Situation of Great Britain in the Year 1811*, p. 71).

the Report. Sinclair was a man of amazing energy, unquenchable enthusiasm for the cause of agriculture, and unabashed in advertising himself and the things for which he stood. He had written a three-volume *History of the Public Revenues of the British Empire* (1785-1790) which had already gone through three editions, in which he had shown partiality for government spending and monetary expansion. On June 24¹ he wrote to Perceval, asking help for a reprinting of his *Public Revenues*, and adding: "Don't you think that it would be right to have it in view, against the time that Parliament reassembles, to prepare an answer to the Report of the Bullion Committee. You know my sentiments regarding the importance of paper Circulation, which is in fact the basis of our prosperity". Whether Sinclair, who even by his friends was regarded as eccentric, received any encouragement from Perceval, or whether he was in any way responsible for stiffening Perceval's opposition to the Report, we do not know. But Sinclair would not have been the man he was had he been deterred from action by failure of others to approve his ideas, and early in September he published the first pamphlet attacking the Bullion Report, *Observations on the Report of the Bullion Committee*. He sent a copy to Perceval, who replied, "It has given me great satisfaction".² Arthur Young, the Secretary of the Board of Agriculture, wrote, "I hope Government is assiduous in the distribution of your pamphlet".³ Whether on his own, or at Government expense, we do not know, but Sinclair, with a covering letter dated September 18, sent a copy to every member of Parliament.⁴

The closing months of 1810 and early 1811 produced a deluge of pamphlets attacking the Report, and the Perceval and Herries papers suggest that, regardless of the status of Sinclair's publications, a number of these pamphlets, both signed and anonymous, were inspired by people close to the Bank and the Government. Charles Bosanquet, Governor of the South Sea Company and son of a former Governor of the Bank, late in 1810 wrote *Practical Observations on the Report of the Bullion-Committee*, probably the most effective of the criticisms of the Report. This was the occasion for Ricardo's *Reply to Mr. Bosanquet's Practical Observations on the Report of the Bullion Committee*. Herries, early in 1811, published an anonymous pamphlet, *A Review of the Controversy Respecting the High Price of Bullion, and the State of our Currency*, and when he sent a copy to Friedrich Gentz, in Vienna, in November 1811, he said that his official position made it advisable that this should not appear over his name.

On September 20, Randle Jackson, a lawyer who specialized in presenting cases before boards and committees, attacked the Report in a speech of nearly an hour at the meeting of the Bank stockholders.

¹ Letter in possession of Mr. David Holland.

² *Memoirs of the Life and Works of Sir John Sinclair, Bart.* By his son the Rev. John Sinclair (1837), vol. II, p. 263.

³ *Ibid.*, p. 266.

⁴ *Morning Post*, September 28, 1810; *The Courier*, September 28, 1810.

His speech, shortly afterward, was published in pamphlet form. It was commonly believed at the time that Jackson had been hired by the Bank management to present the case against the Bullion Report, although on its face value his speech simply gave the views of an interested stockholder.¹ The legalistic tone of his approach is indicated by the fact that, although Horner had sent a written copy of the Report to the Bank before publication² and that subsequently the Speaker of the Commons had sent printed copies to the Bank for every director,³ Jackson opened by saying that he would discuss a pamphlet "professing to be a copy of the Report of the Bullion Committee. . . . He was aware . . . that the publication alluded to was not yet in a shape which the Directors of the Bank could officially notice".⁴ He then went on to develop what became the standard position of the Bank and the Government: the Report had had a serious effect upon commercial credit: "those who were understood to be the leading Members of the Committee, were Gentlemen in the habits of differing in opinion from his Majesty's Ministers"; and the Bank's notes could not have been excessive or raised prices because they were issues only against "value received". The Government papers, non-committal or friendly when the Bullion Report had appeared six weeks earlier, now came out in praise of Jackson and criticism of the Report.

The defenders of the Bullion Report were also articulate and aggressive, and support came from persons who differed among themselves on economic analysis and in political affiliations. The Report contained much economic analysis that was contrary to Ricardo's earlier published views and it was, from Ricardo's single-minded approach, subject to practically all of the criticism that, in his letter of February 5, 1810, he had made of Horner's position. But when the Report appeared Ricardo, if he were to be effective in the field of policy, had either to support or to attack it. He, as many economists since in similar circumstances, chose to support a Report with whose major policy conclusions he agreed, much as he might disagree with important parts of the supporting analysis. On September 6, 1810 the *Morning Chronicle* published a letter from Ricardo defending the Bullion Report, but taking a more critical view toward the Bank than had the Report; on September 18 there followed a letter criticizing Sinclair's

¹ John Whishaw, who had the reputation of an open ear for rumour, in a letter to Horner on October 1 mentioned Jackson's speech "for which he has received or is to receive an handsome present from the Bank" (Ricardo, *Works*, vol. III, p. 9). Cobbett, writing on September 21, also suggested, with sarcastic overtones, that the Bank had hired Jackson to make the speech. *Paper Against Gold* (1815), vol. I, pp. 104-105.

² Letter Book 2, p. 55. Letter of August 25, 1810 returning to Horner the copy with thanks for "his early communication of it". I am indebted to the Bank of England for permission to examine its records of the period.

³ Court Book Ea, p. 382.

⁴ *The Speech of Randle Jackson, Esq., delivered at the General Court of the Bank of England . . .* (1810), p. 3.

Observations, and on September 24 one criticizing Jackson's speech,¹ which Ricardo, who was a stockholder, had heard.²

Horner originally had intended to write an article on the Bullion Report for the *Edinburgh Review*, and when he gave this up he tried without success to have Ricardo do such an article. He then turned to Malthus, who wrote two articles that appeared in February 1811 and in August 1811.³

Malthus' articles had a judicial tone, but were favourable to the general analysis of the Bullion Report on the causes of exchange depreciation. In his first article he brought out the difference between the view of Ricardo and of the Report on the causes of exchange depreciation. He said that "The great fault of Mr. Ricardo's performance, is the partial view which he takes of the causes which operate upon the course of Exchange", and referred to "the error (confined, however, principally to Mr. Ricardo, and from which the Report is entirely free) of denying the existence of a balance of trade or payments, not connected with some original redundancy or deficiency of currency".⁴

The Tory *Quarterly Review*, then controlled by the influential Canning-Huskinson group of Tories, took an even more vigorous stand than the *Edinburgh* in defence of the Bullion Report, and challenged the charges of Sinclair, Jackson, and the Government press that the Bullion Report represented Whig partisanship. Canning and Huskinson had been in the Government together for several years, but were out of office at the time as a result of disagreements relating more to personalities than to policy. The *Morning Chronicle* of September 28, 1810 published the story that:

. . . Negotiation is on the tapis for the return of Mr. Canning and Mr. Huskinson in office. . . . We believe that the Bullion Report has tended to accentuate the Negotiation; for Ministers having found that the efforts of their minor Partizans (the Sinclairs and the Jacksons) would not avail, have felt the necessity of calling in the aid of these more effective allies.

The following day the Tory *Morning Post* commented editorially on the *Morning Chronicle* story:

We believe it to be entirely the reverse of the truth, that the government is not at all disposed to give its support to the measures recommended by the Bullion Committee.

The *Morning Post* was correct as to the view of the Government on the Bullion Report, but that does not rule out the possibility that Canning and Huskinson had tried, without success, to get the Government to take a different position. There is no direct evidence, however,

¹ Reprinted in Ricardo, *Works*, vol. III, pp. 131-153.

² Not only does Ricardo's letter of September 24 make clear that he heard Jackson speak, but a jeering comment in a *Morning Post* editorial of September 22 about a "pamphleteer" at the meeting almost certainly referred to Ricardo.

³ The details of these negotiations are in my "The Authorship of Economic Articles in the *Edinburgh Review*, 1802-47", *Journal of Political Economy*, vol. LXI, June 1953, pp. 236-237.

⁴ *Edinburgh Review*, February 1811, pp. 342, 361.

that an approach to Canning and Huskisson to rejoin the Government had foundered on the Bullion Report,¹ although it is hard to see how Canning and Huskisson could have joined a Government whose position on the Bullion Report differed so sharply from their own.

In any case the difference of opinion on the Bullion Report between Canning and Huskisson and the Tory Government soon became clear. Before Sinclair had published his pamphlet or Randle Jackson had given his speech, Huskisson was busy on *The Question Concerning the Depreciation of our Currency Stated and Examined*.² This was the most widely circulated of all the pamphlets on the Bullion controversy, going through eight editions at the time, and a new edition in 1819. On October 1, 1810 George Ellis, a prominent Tory and one of the high command of the *Quarterly Review*, wrote to John Murray,³ telling him of a pamphlet written by "a friend of mine", and recommending its publication without giving the name of the author. Two days later Murray evidently had accepted this pamphlet, for Ellis wrote that he was sending the manuscript by messenger and asking that proof be sent to Huskisson and also directly to Ellis "to assist him" in getting forward with the re-view of the pamphlet.

Correspondence followed shortly between Huskisson and Perceval, prompted by the premature advertisement of the pamphlet. Huskisson wrote on October 28:⁴

In determining upon this Publication, I have been actuated by two Considerations. 1st, a Wish to impart to others the entire conviction which exists in my own Mind on this question, and to impress upon them the sense I entertain of its vast importance. 2ndly, a wish to separate the question itself from the character which it has been attempted to ascribe to the Bullion Report, in consequence of the Cast of politicks of the Member who presided in the Committee. To do this, if I should succeed, would be, I think, to aid the fair discussion of the question; and, at any rate, the attempt affords me an opportunity of shewing, that, in the view I took of the question, I stood separated from any of that influence which is supposed to have prevailed in the others. These are my motives for publishing, such as you will collect them from the *Preface*, the only part of the Pamphlet which has hitherto been returned to me from the Press; and of which, as it relates to those motives, I send you, prematurely perhaps, a Copy.

¹ In Josceline Bagot, *George Canning and his Friends* (1909), vol. I, pp. 355-363, are several letters relating to the negotiations with Canning about joining the Cabinet, and in the William Clements Library at the University of Michigan and in the Perceval papers in the possession of Mr. David Holland is further correspondence, not given in Bagot, relating to the proposal that Canning join the Cabinet at this time. None of these, however, makes any reference to the Bullion Report.

² In his *Preface*, dated October 23, Huskisson says of Sinclair's pamphlet and the newspaper accounts of Jackson's speech: "Both of these productions appeared long after the following observations were written" (p. iii).

³ This letter is in the files of the firm of John Murray, and all other letters to Murray cited or quoted below are in these Murray files. I am indebted to Sir John Murray, the present head of the firm, for permission to consult them.

⁴ This letter and the copy of Perceval's reply are in the Perceval papers in the possession of Mr. David Holland.

From the feeling I have of the importance of the subject, my most anxious wish is that the question may not be claimed or used in Pt. as a party question—and that Govt. may not be driven or expected to meet it as such. That you would not do so from choice is that of which I am fully convinced. My next wish is that whatever may be proposed by Govt. upon the subject may be such as may appear to me a Remedy adequate to the Evil. To concur with them in the adoption of such a Remedy is all the further part I shall be desirous to take on the occasion, satisfied, as I am, on the one hand, in proportion as the subject shall be made a party question is the danger of the Evil being left, not only unabated, but aggravated, and, on the other hand, without the practical superintendence and careful management of a Govt. convinced of the nature of the Evil, as well as of the necessity of the Remedy, the difficulties of applying that Remedy will be much increased.

Two days later Perceval replied :

I thank you for your Letter and its Enclosure. I shall read your pamphlet with every attention in my power. I must confess, however, that I remain in all the ignorance or under all the prejudice which influenced me in the Committee before the publication of their Report, and the formation of the opinion which they have adopted—and certainly neither the reading of that report nor the Circumstances which have since occurred have to any degree diminished my apprehensions of the ruinous consequences of what that report recommends.

An intriguing question, to which the answer until new papers are discovered can be only negative conjecture, is whether Huskisson and Ricardo had any interchange of ideas in connection with the publication of the pamphlet. Huskisson, in a letter to Murray in regard to final changes in the proof, dated "Wednesday" and evidently sent late in October or early in November 1810 said: "Many thanks to Mr. Ricardo for his notes—I am not at leisure at this moment to observe on them". In the context it would appear that whatever Ricardo had sent through Murray was at Ricardo's initiative and not at Huskisson's request. It is not even certain that the notes referred to Huskisson's pamphlet, and in any case there is no evidence that Huskisson made any use of Ricardo's notes. Huskisson sent a copy of his pamphlet to Ricardo, and Ricardo read it with care, annotated his copy, and also prepared separate notes.¹

For the next three months Ellis, Canning and Huskisson, with the support of William Gifford, the *Quarterly's* editor, carried on a co-ordinated campaign on behalf of the Bullion Report. Canning also received proofs of Huskisson's pamphlet, and possibly edited them. Some passages in Ellis' review of Huskisson, which both Huskisson and Canning saw in proof, were drafted by Huskisson, and Canning probably made editorial changes. Ellis' review of Sinclair's pamphlet that appeared in the same issue of the *Quarterly* contained passages

¹ Ricardo, *Works*, vol. X, p. 400. In an editorial note Sraffa says that in the Ricardo papers there is, "a small wrapper inscribed by Ricardo 'Remarks on Mr. Huskisson's pamphlet', but unfortunately it is empty".

drafted by Canning¹ and probably also by Huskisson. Two further articles on the Bullion question in the February 1811 issue were principally from Ellis' pen, but Canning made some contribution to them, and although there is no documentation to prove that Huskisson was a co-author, it is quite likely that the final articles, if they did not contain his words, at least reflected his suggestions.

Horner was pleased with the *Quarterly's* stand and he wrote to Francis Jeffrey, editor of the *Edinburgh Review*, just after the review of Huskisson and Sinclair appeared:² "The *Quarterly Review* was sure to be right about depreciation; being under the command of Canning, who is under the command of Huskisson". But many Tories were not so pleased with a development which had so deflated the charges of Sinclair and Jackson that the Bullion Report was a Whig plot. Evidently pressure was brought to bear on the *Quarterly* to take a different view on the Bullion Report, because when Ellis, in late November or early December, sent the manuscript of his review of Huskisson to Murray, he wrote:

Your last letter astonished me a good deal—for who could expect such impertinent interference? Gifford's account of *his* interview delighted me. Those who may wish to *dictate* opinions for our adoption had better take care ; . . .

The situation created bitterness within Tory ranks, and in the debates in 1811 there were a number of overtones that suggested strong personal feelings as a result of the mixed party situation. Herries' remark, in his letter of November 11, 1811, to Gentz, in regard to Huskisson's role in the controversy, is indicative of the situation:

Je crois que la plupart des amis de ce dernier sont très fâchés pour lui de la part qu'il a prit dans cette controverse.

The Bullion Report was discussed in the House in May 1811 in a full dress debate that covered four days,³ and its principal defenders were Horner (Whig of independent leanings), Thornton (independent who had generally supported the Government), Huskisson (Tory), Henry Parnell (Whig), and George Canning (Tory). No leader in the Whig party councils⁴ took a prominent part in support of the Report, and with the exception of Horner, the emphasis of the defenders of the Report was on the Bank recognizing that its credit policy had some influence on commodity prices and on the foreign exchanges, rather than on the questionable recommendation of resumption of

¹ Ellis wrote to Murray on November 25 in regard to the first proofs of the review: "... Canning . . . is as anxious to see it as I am to shew it to him ; . . .", and shortly thereafter he forwarded to Murray proofs on which Canning had made "several additional alterations and improvements".

² *Memoirs and Correspondence of Francis Horner*, 2nd ed. (Boston and London, 1853), vol. II, p. 47.

³ *Hansard*, New Series, vol. XIX, 798-1012, 1020-1127, 1151-1169.

⁴ I found helpful, in forming my judgment on Whig leadership, the article by Michael Roberts, "The Leadership of the Whig Party in the House of Commons from 1807 to 1815", *The English Historical Review*, vol. I, October 1935, pp. 620-638.

specie payments in two years. Horner presented sixteen resolutions, in line with the recommendations of the Bullion Report. His first resolution on general monetary policy was defeated 151—75, fourteen other resolutions, in spirit allied to the first, were defeated without record vote, and his final resolution for opening the Bank in two years was defeated 180—45.¹

The defeat of Horner's resolutions was followed by Vansittart's famous resolutions, which stated in a positive way the monetary views of the Bank and of the Government, including the statement that the Bank notes "are at this time, held in public estimation to be equivalent to the legal coin of the realm". The debate on these resolutions largely repeated the Bullion debate arguments, and they were carried by a substantial majority.² For the remainder of the war the monetary issue was quiescent, and was revived only in a new setting after Waterloo.

The Bullion Report was the product of compromise between those who, like Horner, felt that the Bank's uncritical acceptance of the "real bills" doctrine was so dangerous that the only adequate safeguard was a speedy resumption of specie payments, and those who disagreed with the Bank's monetary theory but felt that this did not justify the risk of attempting a resumption of payments in time of war. Probably no two members of the Bullion Committee held exactly the same views, and their differences arose from a complex of considerations that transcended conventional economic analysis. The same situation existed outside the Committee, where support of the Report represented compromises between monetary theory, policy in a given situation, and political expediency. Thornton, although he disapproved in principle of Horner's Parliamentary motion in May 1811 to resume payments in two years, was willing to vote for it as a protest against the rejection by Parliament of the view that the Bank of England influenced the exchanges; Canning, although apparently in full agreement with Thornton's theory and with his fears of the consequences of the "real bills" doctrine, refused to support the motion for resumption in two years; and Ricardo became the champion of a Report that had rejected his particular version of the theory of exchange rate fluctuations, but whose policy conclusions were in line with his own.

A desire to embarrass the Tory Government may have played a part in the position taken by some members of Parliament, both on and off the Committee, but the record makes it clear that this was not a major influence in producing the Report or in the campaign on its behalf. With human nature as it is, it would be strange if some member of Parliament did not have his faith in the principles of the Bullion Report strengthened by the feeling that its conclusions must

¹ *Hansard*, New Series, vol. XIX, 1169, May 9, 1811.

² The debate on these resolutions is in *Hansard*, New Series, vol. XX, 1—128, 134—146, 150—176, May 13 and 15, 1811. The report on the vote is on 172—176.

be distasteful to the Government of the day; but the forces that produced the Report and that championed it were far more powerful than partisan politics. The Bullion Report and the controversy that followed were political only in the broad sense that many independents and political leaders, both Whig and Tory, used the machinery of politics to oppose what they considered a dangerous monetary development.

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APPENDIX

POLITICS AND PROFESSIONS OF THE MEMBERS OF THE BULLION COMMITTEE OF 1810¹

<i>Voting for Report</i>	<i>Politics in 1810</i>	<i>Profession</i>
James Abercrombie (later 1st Baron Dunfermline)	Whig	Lawyer
*Thomas Brand (later 20th Baron Dacre).	Whig	Lawyer and country gentleman
*William Dickinson	Independent who formerly supported Pitt but now usually voted against Government	Lawyer
Davies Giddy	Independent who usually supported Government	Man of letters and country gentleman
Pascoe Grenfell	Whig sympathies	Metal merchant and mine promoter
Francis Horner	Whig	Lawyer
William Huskisson	Tory	Lawyer
*George Johnstone	Independent	Employee of East India Co. and Commissioner of India Board
*Magens Dorien Magens	Independent who generally supported Government	London banker
Henry Parnell (later 1st Baron Congleton)	Whig	—
Richard Sharp	Whig	West India merchant and hat manufacturer

¹ For assistance in obtaining biographical details about members I am indebted to Mr. E. L. C. Mullins, the Secretary of The History of Parliament Trust, but I prepared the list on the basis of all available information and, if any one feels that it is in error, the blame must fall on me. In view of the fact that party lines were not as sharply drawn then as in present-day politics, probably no two students of the period would be in complete agreement as to how some of the independent members, or those with shifting allegiances, should have been classed in 1810.

* Indicates not in DNB. Where no profession is indicated, it could be presumed that the man was a "country gentleman".

<i>Voting for Report</i>	<i>Politics in 1810</i>	<i>Profession</i>
Henry Thornton	Independent, but had generally supported Pitt	London banker
George Tierney	Whig	—
<i>Voting against Report</i>	<i>Politics in 1810</i>	<i>Profession</i>
Alexander Baring (later 1st Baron Ashburton)	Independent with Whig leanings at this time	London banker
¹ John Irving	Tory	London merchant
Charles Long (later 1st Baron Farnborough)	Tory	Paymaster General in 1810
¹ William Manning	Tory	Deputy Governor of Bank of England, 1810
Spencer Perceval	Tory	Prime Minister and Chancellor of Exchequer in 1810
¹ Thomas Thompson	Independent who frequently opposed Government at this time	Merchant and Banker of Hull
<i>Not Voting</i>	<i>Politics in 1810</i>	<i>Profession</i>
John Leslie Foster	Tory	Lawyer
Richard B. Sheridan	Whig	Playwright
Lord Temple (later 3rd Viscount Palmerston)	Tory	—

¹ Indicates not in DNB. Where no profession is indicated, it could be presumed that the man was a "country gentleman".

Rational Choice Functions and Orderings¹

By KENNETH J. ARROW

1. INTRODUCTION

The language of the theory of consumers' demand is still somewhat confused despite the great progress that has been made in recent years.² The basic purpose of the theory is to explain the demand vector $d(p, M)$ chosen by an individual when faced with a price vector p and an income M . Cournot, who introduced the concept of the demand function, and others, simply postulated some properties such as monotonic decrease of demand for any commodity with respect to its own price. The development of utility theory in the second half of the 19th century by Gossen, Jevons, Menger, and Walras and its subsequent reinterpretation on an ordinal basis by Pareto led to an alternative formulation in terms of an ordering of all conceivable commodity bundles. The demand vector for a particular p and M is that vector among all those compatible with the budget limitation which is most preferred.

The derivation of demand functions from orderings (expressed as indifference maps or utility functions) became standard and its fruitfulness in yielding implications for demand functions was made evident by the work of Slutsky [14], Hicks and Allen [7], Hotelling [8], and Roy [12]. Apart from the problems raised by the integrability question,³ the first distinctly novel approach was the revealed preference approach of Samuelson [13]. Here again an assumption is made on the demand function (see C5 below). From this assumption a number of properties of the demand function can be deduced, though so far not as many as from the assumption of an underlying ordering.

A good deal of effort has gone into finding assumptions on the demand function which would imply the existence of an ordering from which it could be derived. So far, Samuelson's original assumption (now generally known as the Weak Axiom of Revealed Preference) has not been found sufficiently strong.⁴ Independently, Ville [16] and Houthakker [9] have shown that a modification of this axiom, referred

¹ This paper was prepared during the tenure of a Ford Foundation Faculty Fellowship, with secretarial assistance from the Office of Naval Research, and read on 12 September 1958 before the Econometric Society meeting in Bilbao, Spain. I wish to thank Charles Ying and Tjalling Koopmans of the Cowles Foundation for Research in Economics, and Harold Dickson of the University of Göteborg, for helpful comments. The paper will be reprinted as a Cowles Foundation Paper.

² For recent restatements of the theory, see Wold [17], Part II, and Hicks [6].

³ Georgescu-Roegen ([5], pp. 567-8) conclusively showed that the real issue behind the integrability problem was the question of transitivity. In terms of the present paper, the integrability problem is a somewhat misleading way of putting the problem of the relation between assumptions on the demand functions and the existence of an ordering which generates them.

⁴ Despite a common opinion, it has not yet been shown that the Weak Axiom is not sufficient to ensure the desired result. The question is still open.

to as the Strong Axiom of Revealed Preference (see C1 below) is sufficient to ensure the desired result.

Both demand functions and orderings can be regarded as special cases of choice functions. For any set of alternatives X let $C(X)$ be the set of alternatives chosen (we admit the possibility that more than one alternative be chosen). The function $C(X)$ is of course not necessarily defined for all possible sets X . Let β be the class of sets for which $C(X)$ is defined. The revealed-preference and other demand-function approaches essentially deal with the case where β is the class of sets defined by budget constraints of the form,

$$(1) \quad \sum p_i x_i \leq M, \quad x_i \geq 0.^1$$

On the other hand, an ordering can be interpreted as a series of statements about choices from sets containing two elements. Choices from larger sets, including those defined by (1), are defined in terms of the binary choices. Thus the choice functions defined by an ordering are defined for a class β which includes not only sets of form (1) but many others, including in particular two-element sets and in fact all finite sets.

It is the suggestion of this paper that the demand-function point of view would be greatly simplified if the range over which the choice functions are considered to be determined is broadened to include all finite sets. Indeed, as Georgescu-Roegen has remarked, the intuitive justification of such assumptions as the Weak Axiom of Revealed Preference has no relation to the special form of the budget constraint sets but is based rather on implicit consideration of two-element sets (see [4], p. 125, fn. 29).

2. DEFINITIONS

The investigation suggested in the Introduction has already been begun in a significant paper by Uzawa [15] and his notation is followed here with minor modifications.

A binary relation R is said to be a *weak ordering* if

(R1) for all x and y , xRy or yRx ,

(R2) for all x , y and z , xRy and yRz imply xRz .

A choice function $C(X)$ maps a non-null set X into a non-null subset. It is defined for all X in some class β . We make the following

Assumption: The domain of definition β of any choice function $C(X)$ contains all finite sets.

Definition 1. For any binary relation R , we define

$$C(X) = \{x | x \in X, xRy \text{ for all } y \in X\},$$

to be the *choice function derived from R* .

Definition 2. For any choice function $C(X)$, we define

$$xRy = \text{df. } x \in C(\{x, y\}),$$

to be the *relation generated by $C(X)$* .

¹ The budget constraint is here written in the form used by current theory, which stresses inequalities and non-negativity constraints.

Here $\{x, y\}$ is the set consisting of the two elements x and y . The motivation of these definitions is obvious.

We now wish to make assumptions about choice functions. Since these assumptions are those of rational behaviour, we follow Uzawa in referring to choice functions satisfying them as *rational choice functions*. We give altogether five definitions of a rational choice function and study the relations of implication among them and to the existence of a weak ordering. First, we introduce two more relations defined by a given choice function.

Definition 3. We say that x is *revealed preferred* to y (symbolized by $x \tilde{P} y$) if, and only if, for some $X \in \beta$, $x \in C(X)$ and $y \in X - C(X)$.

Definition 4. The element x is *indirectly revealed preferred* to y (xP^*y) if, and only if, there exist x^i ($i=0, \dots, n$) such that $x^0=x$, $x^n=y$, and $x^{i-1}\tilde{P}x^i$ ($i=1, \dots, n$).

Uzawa has suggested the following two definitions for rational choice functions:

(C1) For all x and y , if there exists an X for which $x \in C(X)$, $y \in C(X)$, then xP^*y . (The bar denotes negation.)

(C2) If $X \subset Y$, then $X - C(X) \subset Y - C(Y)$.

(By $X \subset Y$ is meant that every alternative in X also belongs to Y . By $A - B$ is meant the set of alternatives in A but not in B .) (C1) is a form of the Strong Axiom of Revealed Preference due to Ville and Houthakker. (C2), as will be seen below, is a weaker assumption. It asserts that any element not chosen from a set of alternatives X will not be chosen if the range of alternatives is widened.

It will be shown below that the following condition is equivalent to (C2):

(C3) If $X \subset Y$, then $C(Y) \cap X \subset C(X)$.¹

(By $A \cap B$ is meant the set of alternatives in both A and B .) Because (C2) and its equivalent (C3) are weak assumptions, a slight strengthening is called for.

(C4) If $X \subset Y$ and $C(Y) \cap X$ is non-null, then $C(X) = C(Y) \cap X$.

This can be given the following intuitive interpretation: if some elements are chosen out of a set Y and then the range of alternatives is narrowed to X but still contains some previously chosen elements, no previously unchosen element becomes chosen and no previously chosen element becomes unchosen.²

Finally, we introduce the definition of rationality by the Weak Axiom of Revealed Preference.

(C5) If $x\tilde{P}y$, then there exists no Y such that $x \in Y$, $y \in C(Y)$.

¹ This is the same as postulated in Chernoff [2], pp. 429-30.

² Definition (C4) was originally introduced in [1], pp. 4-8, and the properties presented in this paper were first proved there.

3. INTERRELATIONS AMONG DEFINITIONS OF RATIONAL CHOICE FUNCTIONS

We first establish relations of logical implication among the definitions of rational choice functions.

Theorem 1. Definition (C1) implies definitions (C2-5); (C4) and (C5) are equivalent and imply (C2) and (C3); (C2) and (C3) are equivalent.

It suffices to prove (a) (C1) implies (C5); (b) (C4) and (C5) are equivalent; (c) (C4) implies (C3), and (d) (C2) and (C3) are equivalent.

(a) Suppose (C1) holds and (C5) does not. Then we can choose x, y, Y so that $x\tilde{P}y, x \in Y, y \in C(Y)$. If $x \in Y - C(Y)$, then $y\tilde{P}x$; by Definition 4, yP^*y , which contradicts (C1). If $x \in C(Y)$, then again (C1) is contradicted, since $x\tilde{P}y$ implies xP^*y , while both x and y belong to $C(Y)$.

(b) First we prove that (C4) implies (C5). Suppose (C4) true and (C5) false. Then there exist x, y, X, Y , such that

- (2) $x \in C(X),$
- (3) $y \in X - C(X),$
- (4) $x \in Y,$
- (5) $y \in C(Y).$

From (2-3), $\{x, y\} \subset X$, and $\{x, y\} \cap C(X)$ contains the single element x . From (C4),

$$(6) \quad C(\{x, y\}) = \{x\}.$$

But from (4-5), $\{x, y\} \subset Y$, and from (5), $\{x, y\} \cap C(Y)$ is non-null and contains y . By (C4), $y \in C(\{x, y\})$, which contradicts (6), unless $y = x$; but this last is impossible from (2) and (3).

Now suppose that (C5) and the hypothesis of (C4) hold but that $C(X) \neq C(Y) \cap X$. Then either (i) $C(X) - [C(Y) \cap X]$ is non-null, or (ii) $[C(Y) \cap X] - C(X)$ is non-null.

(i) Let $y \in C(X) - [C(Y) \cap X], x \in C(Y) \cap X$. Then $x \in C(Y), y \in Y$ (since $y \in C(X) \subset X \subset Y$), and $y \notin C(Y)$, so that $y \in Y - C(Y)$, and therefore $x\tilde{P}y$. But $y \in C(X), x \in X$, a contradiction to (C5).

(ii) Let $x \in C(X), y \in [C(Y) \cap X] - C(X)$. Then $x \in C(X), y \in X - C(X)$, so that $x\tilde{P}y$. But $x \in C(X) \subset X \subset Y, y \in C(Y)$, which again contradicts (C4).

(iii) If $C(Y) \cap X$ is non-null, then clearly (C4) implies (C3). If $C(Y) \cap X$ is null, then (C3) holds in any case.

(iv) Suppose $X \subset Y$. If (C2) holds, then $X - C(X)$ is disjoint from $C(Y)$, that is, $C(Y) \cap [X - C(X)]$ is null. This is equivalent to the statement that $[C(Y) \cap X] - C(X)$ is null, which in turn is equivalent to the conclusion of (C3). Conversely, if (C3) holds, then $[C(Y) \cap X] - C(X)$ is null, which is equivalent to saying $C(Y) \cap [X - C(X)]$ is null,

and therefore $X - C(X)$ is disjoint from $C(Y)$. But $X - C(X) \subset X \subset Y$, so that the conclusion of (C2) follows.

We will see (Corollary to Theorem 3) that a slightly stronger statement can be made than that contained in Theorem 1, namely that (C1), (C4), and (C5) are all equivalent.

4. WEAK ORDERINGS AND DERIVED CHOICE FUNCTIONS

Theorem 2. If R is a weak ordering, let $C(X)$ be the choice function derived from it and R' the relation generated by $C(X)$. Then $C(X)$ satisfies (C1-5) and R' is identical with R .

Proof: That $C(X)$ satisfies (C1) is shown by Uzawa ([15], Theorem 1). By Theorem 1, then, $C(X)$ satisfies (C2-5). By Definition 2, $xR'y$ if, and only if, $x \in C(\{x, y\})$ and, by Definition 1, if, and only if, both xRx and xRy . But xRx holds for all x , from (R1).

Theorem 2 is in the usual direction of implications from assumptions about orderings or indifference maps to properties of the demand functions, or the choice functions in a more generalized setting.

5. RATIONAL CHOICE FUNCTIONS AND RELATIONS GENERATED BY THEM

Theorem 3. If $C(X)$ satisfies (C1), (C4), or (C5), let R be the relation generated by $C(X)$ and $C'(X)$ the choice function derived from R . Then R is a weak ordering, and $C'(X) = C(X)$.

Proof: It suffices to assume that $C(X)$ satisfies (C4) in view of Theorem 1.

For all x and y , $C(\{x, y\})$ is defined, since $\{x, y\}$ is a finite set; either $x \in C(\{x, y\})$, or $y \in C(\{x, y\})$, that is, either xRy or yRx , so that (R1) holds.

Now suppose xRy and yRz . If $y=z$ or if $x=y$, the conclusion xRz follows immediately. If $x=z$, then xRz is the same as xRx , which follows from (R1), already established. Now suppose x, y, z distinct. Let X consist of the elements x, y, z and suppose $x \notin C(X)$. If $y \in C(X)$, $\{x, y\} \cap C(X)$ is non-null so that $C(\{x, y\}) = \{x, y\} \cap C(X)$. Since $x \in C(\{x, y\})$ by assumption, $x \in C(X)$, a contradiction.

(7) $x \notin C(X)$ implies $y \notin C(X)$.

By exactly the same argument, $y \notin C(X)$ implies that $z \notin C(X)$. But with the aid of (7), $x \notin C(X)$ implies that $C(X)$ is null, which is contrary to the basic assumption. Hence $x \in C(X)$. Since $x \in \{x, z\} \cap C(X)$, $\{x, z\} \cap C(X)$ is non-null; by (C4), $x \in C(\{x, z\})$, or xRz . Therefore (R2) holds, and R is a weak ordering.

Let $x \in C(X)$, y be any element of X . Then $x \in \{x, y\} \cap C(X)$ and therefore $x \in C(\{x, y\})$, or xRy . From Definition 1, $x \in C'(X)$, therefore

(8) $C(X) \subset C'(X)$.

Let $x \in C'(X)$, $y \in C(X)$. Then $\{x, y\} \cap C(X)$ is non-null. Since xRy , by Definition 1, $x \in C(\{x, y\}) = \{x, y\} \cap C(X) \subset C(X)$, so that $C'(X) \subset C(X)$. In conjunction with (8), the theorem is proved.

Corollary. Definition (C1) is equivalent to Definitions (C4) and (C5).

Proof: That (C1) implies (C4) and (C5) is already stated in Theorem 1. Suppose $C(X)$ satisfies (C4) or (C5). Then, by Theorem 3, $C(X) = C'(X)$, where $C'(X)$ is derived from a weak ordering R and therefore satisfies (C1), by Theorem 2.

Remark 1. Let P be the relation of preference derived from a weak ordering R , that is, xPy if, and only if, xRy and not yRx . Then Uzawa has shown ([15], Theorem 3) that under the assumption $P = P^*$, so that under any of the definitions of a rational choice function (C1, 4, or 5) the relation of preference coincides with that of indirect revealed preference.

Remark 2. Conditions (C2) or (C3) are not sufficient for Theorem 3, as can easily be seen from the following example: Let R be an ordering, $C(X)$ the choice function derived from R , and $C'(X) = C(X)$ for all sets X other than those containing two elements, for which $C'(X) = X$. By Theorem 2, $C(X)$ satisfies (C2). On the other hand, if X has one or two elements, $X - C'(X)$ is the null set so that

(9) $\text{if } X \subset Y, \text{ then } X - C'(X) \subset Y - C'(Y),$

whenever X has not more than two elements. If X has more than two elements, then Y must also, and (9) holds since then $C'(X) = C(X)$ and $C'(Y) = C(Y)$. As can be seen from (C3), the problem is that when passing from Y to a subset X , the choice set $C(X)$ may be relatively too big.

Uzawa ([15], Theorem 4) has shown that if $C(X)$ contains only a single element for all X , then (C2) is a sufficient condition for the results of Theorem 3; however, the assumption that $C(X)$ contains only a single element rules out the possibility of indifference.

6. GENERAL REMARK

The most interesting conclusion is the complete equivalence of the Weak Axiom of Revealed Preference with the existence of an ordering from which the choice function can be derived. This equivalence is demonstrable by very elementary means provided we concede that choices should be definable from finite sets as well as budget constraint sets. It is true that very interesting mathematical problems are bypassed by this point of view, but this should not perhaps be a compelling consideration.

It has already been argued that requiring the choice functions to be defined for finite sets is thoroughly consistent with the intuitive arguments underlying revealed preference. It should also be observed that any hope of using experimental methods for studying preference will require inferring from choices on finite sets to choices on infinite ones (see May [10], Papandreou [11], and for a somewhat different but parallel situation, Davidson and Suppes [3]).

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On the Sales Maximization Hypothesis

By M. H. PESTON

In a recent paper in this journal¹ Professor Baumol points out that the simple profit maximizing hypothesis is not only not a good description of the facts of business behaviour, it is also not a good explanation of them. He, therefore, supports an alternative theory, namely that subject to a minimum profit constraint the firm will endeavour to maximize sales measured by gross revenue.

To appreciate this hypothesis it is of interest to examine it within a more general framework. Suppose that the firm's objectives are given by the following preference function:

$$(1) \quad U = u(\pi, R)$$

where π = short-run profit

R = gross revenue which is a measure of sales.

Ordinarily the assumption is made that $\frac{\partial u}{\partial \pi} > 0$ and $\frac{\partial u}{\partial R} = 0$. Baumol's assumption is that for π greater than $\bar{\pi}$, $\frac{\partial u}{\partial \pi} = 0$, and $\frac{\partial u}{\partial R} > 0$.² A more general view, however, would comprehend both of these and allow $\frac{\partial u}{\partial \pi} \geq 0$ and $\frac{\partial u}{\partial R} \geq 0$, with the most interesting case in which only the strict inequality signs are taken to hold.

The object of the present paper is to discuss Baumol's hypothesis in its specific form, and to investigate more generally the conditions under which $\frac{\partial u}{\partial R}$ might be positive.³ In other words we wish to answer

two questions: (a) under what circumstances will the firm maximize gross revenue subject to a minimum profit constraint?; (b) under what circumstances will the firm wish to achieve a revenue greater than that obtained when short-run profit is maximized?

Our method of approach will be taxonomic. A number of factors additional to those included in the most elementary theory of the firm

¹ W. J. Baumol, "On the Theory of Oligopoly", *Economica*, August, 1958.

² Baumol also notes that for some firms of which he has experience $\frac{\partial u}{\partial \pi} = 0$, for $\pi > \bar{\pi}$, where π is defined as long-run profits and not short-run profits as in equation 1. Here the long-run aspect of the problem will be distinguished from the short-run in order to examine possible relationships between the two; *vide infra*, p. 131.

³ For convenience we shall refer to the hypothesis as Baumol's although the sales maximization aspect of it has been discussed by several economists much earlier than the article cited.

will be considered, and it will be shown that virtually any of these may account for $\frac{\partial u}{\partial R}$ being positive. However, many of them do not rule out the alternative possibility, that $\frac{\partial u}{\partial R}$ is negative. In particular, whereas

at least one hypothesis, that the firm's objective is to maximize long-run profits, can be formulated in such a way as to provide a sufficient explanation of the phenomenon under discussion, it has the potential disadvantage that it may be interpreted in such a way that maximum long-run profits are always obtained *ex post*. In this case it would be little more than an untestable rationalisation.

The factors which we will discuss here are: (a) long-run profits; (b) growth and the supply of new funds; (c) oligopolistic interdependence; (d) ignorance of the revenue function and variations in technology. Before dealing with each of them, however, it is as well to reiterate as a perhaps rather trivial starting point that the fact that firms have aims other than short-run profit maximization is by no means *prima facie* evidence of their irrationality.¹ Indeed, where ownership and control are partially separated, it is well known that the reverse may be true, and that the controllers of the firm may give considerable weight in the decision-making processes to their own salaries and prestige. Moreover, it is worth noting that in their recent work which analyses a large variety of business experience R. S. Edwards and H. Townsend² enumerate many motives which give rise to business enterprise of which short-run profit maximization does not figure as the dominant one. They mention such motives as income, emulation, social acclaim, adventure, and power. To quote them,³ "the motives that prompt the actions of business men in their efforts to expand their activities thus range from the relatively simple urge to increase profits in order to raise a family's standard of living to the complex and daemonic incitement to found an industrial empire".

LONG-RUN PROFIT MAXIMIZATION

If profits in later periods are a function of revenue in the present, the firm in maximizing long-run profits will not necessarily simultaneously

¹ *Vid.* Baumol, *ibid.*, p. 188.

² *Business Enterprise*, Macmillan, 1958.

³ *Ibid.*, p. 39. In the same book Dr. N. A. de Bruyne, Managing Director, Aero Research Limited, is quoted as saying (p. 103) that the motive of profit maximization should be replaced by the more general desire to maximize enjoyment of life. The two, however, are not incompatible, and the former may frequently be a necessary condition for the latter; thus, the extension of the firm's preference function to treat the businessman as a consumer does not necessarily imply the abandonment of the profit maximization assumption.

Further evidence on business objectives is provided by C. F. Carter and B. H. Williams, *Industry and Technical Progress*, Oxford University Press, 1957, pp. 82-5. In an empirical study of the criteria employed by firms to determine whether to proceed with an innovation they note that only a small percentage of their sample used an explicit financial criterion. Further, most of the motives reported are not comprehended by a simple profit maximization hypothesis.

maximize short-run profits.¹ Indeed, if it is assumed that revenues in periods $i+1, \dots, i+n$ vary directly with revenue in period i , it follows simply that in maximizing profits over the $n+1$ periods (suitably discounted) the firm will increase revenue in period i somewhat at the expense of profits in period i .²

Unfortunately, not a great deal is known about the behaviour of revenue functions over time. While it may well be the case that, as present sales increase, the demand curve reconstitutes itself at a higher level than in the present period, this process may have an upper limit beyond which the opposite effect occurs, namely a reconstitution of demand at a lower level.³

Even if it assumed that future revenues are an increasing function of present revenue, the simplicity of this model, which summarises such diverse objectives as achieving stability of growth of sales and profits over time, or obtaining a fair share of the market, obscures a certain

¹ Long-run profit maximization is also, of course, not necessarily the only rational objective of the firm. Cf. Baumol, *ibid.*, p. 187, where he suggests that even additional long-run profits may be given up in favour of higher present sales.

² The point may be established precisely as follows.

Write

π	=long-run profits discounted to the present.
π_{i+j}	=profits in the $i+j^{\text{th}}$ period, $j=0, \dots, n$.
X_{ik}	=output of the k^{th} product in period i .
R_{i+j}	=total revenue in the $i+j^{\text{th}}$ period.
C_i	=total cost in the i^{th} period.
α_{i+j}	=the discount factor of the $i+j^{\text{th}}$ period to the present. ($\alpha_i=1$, since i is the present period.)

In the i^{th} period the firm will endeavour to maximize π with respect to X_{ik} where variations in X_{ik} affect R_{i+j} and C_i . Thus, we will have:

$$(2) \quad \frac{\partial \pi}{\partial x_{ik}} = 0$$

$$(3) \quad \sum_{j=0}^n \alpha_{i+j} \frac{\partial \pi_{i+j}}{\partial x_{ik}} = 0$$

$$(4) \quad \frac{\partial R_i}{\partial x_{ik}} - \frac{\partial C_i}{\partial x_{ik}} + \sum_{j=1}^n \alpha_{i+j} \frac{\partial R_{i+j}}{\partial R_i} \cdot \frac{\partial R_i}{\partial x_{ik}} = 0$$

$$(5) \quad \therefore \frac{\partial R_i}{\partial x_{ik}} \left(1 + \sum_{j=1}^n \alpha_{i+j} \frac{\partial R_{i+j}}{\partial R_i} \right) = \frac{\partial C_i}{\partial x_{ik}}$$

If $\alpha_{i+j} \frac{\partial R_{i+j}}{\partial R_i} < 0$, $j=1, \dots, n$, $\frac{\partial R_i}{\partial x_{ik}}$ is a monotonically decreasing function of x_{ik} and $\frac{\partial C_i}{\partial x_{ik}}$ is a monotonically increasing function of x_{ik} over the relevant range, any

x_{ik} which is a solution to 5, is greater than the x_{ik} which is a solution to $\frac{\partial R_i}{\partial x_{ik}} = \frac{\partial C_i}{\partial x_{ik}}$.

In other words, long-run profit maximization will involve the exchange of some short-run profits for revenue. It will be noted that this conclusion may be modified somewhat to the extent that future costs are a function of present outputs, for example, higher present outputs may lead to a disproportionately more rapid wear of equipment.

³ Vid. O. Morgenstern, "Demand Theory Reconsidered", *Quarterly Journal of Economics*, February, 1948. H. Leibenstein, "Bandwagon, Snob and Veblen Effects in the Theory of Consumer Demand", *Quarterly Journal of Economics*, May, 1950, is also relevant in this context.

lack of testability. It is based on the very simple proposition that if the relevant marginal revenue curve in the present period shifts to the right, the requisite output will also shift to the right. This shift is compounded of two parts, effects on future revenues, and the discounting factors. Now, if measurements of these can be obtained *ex ante*,¹ and are not merely *ex post* rationalisations by the entrepreneur, it is possible to determine whether the firm is achieving specified objectives. Otherwise, one is left solely with the conclusion that the firm does what it does, and cannot do anything else.

An example where this difficulty of testability arises is cited by Baumol.² As evidence of non-profit maximizing behaviour, he refers to a watch distributor whose revenue from some retailers did not meet even costs of selling to them. A similar situation exists in the London ladies clothing industry where firms spend considerable time and effort endeavouring to sell to various large retailers, the cost of which is frequently not met by eventual orders.³ An obvious explanation of this is that the firms' behaviour is based on long-run profit maximization, but without independent evidence of the extent to which they discount the future and the way in which future revenues depend on present activity such an argument would be at best undecided and at worst incapable of being decided.

GROWTH AND THE SUPPLY OF NEW FUNDS

A firm's ability to raise funds in the market by the issue of either equity or bonds depends in large measure on the attractiveness of its record and prospects relative to those of other firms with which it may be competing in the capital market. Thus, if people who are allocating funds in the market give weight to the revenue position of the firm as well as its profits in their preference functions,⁴ $\frac{\partial u}{\partial R}$ for the firm may also

¹ For example, the α_{i+j} may be related to rates of interest ruling in the money market, and the $\frac{\partial R_{i+j}}{\partial R_i}$ may be obtained from a statistical analysis of past behaviour

of the firm and other relevant data. If information of this kind is available *ex ante* it is possible to test the relevance of the long-run profit maximization hypothesis. Otherwise, there is no way of distinguishing between this and a hundred and one other explanations of business behaviour.

² "Marginalism and the Demand for Cash in Light of Operations Research Experience", *The Review of Economics and Statistics*, August, 1958, p. 212. While the present paper is concerned with the consideration of alternative preference functions for the firm, it is worth noting that recent operations research seems to indicate the need for modifications of another part of the theory of the firm, that concerned with cost functions. The assumption that the firm's factor combinations are optimal so that its cost curve is a minimum seems to be equally at variance with the facts as the profit maximization hypothesis.

³ The problem is, of course, further complicated by the fact that firms frequently chase these orders when operating at full capacity and are unable to fulfil them if they were obtained.

⁴ This again is by no means irrational. Firstly, investors may be taking long-run profits into account as discussed in the previous section; secondly, they may feel that risk varies inversely with revenue; and thirdly, there may be certain economies in the actual mechanics of fund-raising in the capital market consequent on an

be positive. The conditions for this to be so are that the firm wishes to maximize the flow of new funds towards itself, or that the specified quantity it requires cannot be obtained solely on the basis of maximum short-run profit and its associated revenue.

Conversely, if the market allocates funds on the basis of relative profitability, firms which are able to make relatively high short-run profits will not be obliged to maximize profits if they do not wish simultaneously to maximize their ability to raise capital. In particular, if oligopolistic firms are able to make profits considerably higher than those ruling in more competitive sectors of the economy, then they would certainly be in a position to take the achievement of the competitive rate (or one slightly higher) as sufficient for capital raising purposes, and concentrate on other objectives if they so wished.

One reason for pursuing greater revenue at the expense of short-run profit is to achieve growth. In so far as the size of the firm is measured by its revenue this is a trivial proposition. It is also true, however, so long as the supply of capital to the firm is an increasing function of revenue. Assume for the moment that capital available for growth is equal to new funds obtained from the market, which are a function of revenue, plus profits. We have $S=f(R)+\pi$ where S = capital available for growth. S is at a maximum when

$$(6) \quad \frac{\partial S}{\partial x} = \frac{\partial f}{\partial R} \cdot \frac{\partial R}{\partial x} + \frac{\partial \pi}{\partial x} = 0.$$

If revenue is an increasing function of output, and external capital supplies are an increasing function of revenue, $\frac{\partial f}{\partial R} \cdot \frac{\partial R}{\partial x}$ will be positive so that $\frac{\partial \pi}{\partial x}$ must be negative. In other words, the optimum output will be greater than that at which profits are maximized.¹

This hypothesis does have the advantage that it is partly testable in the sense that it may be possible to discover whether or not $\frac{\partial f}{\partial R}$ is

increase in scale. The factor of risk, however, is by no means clear-cut, and it may well be that after a point increases in revenue are considered to involve increasing risk.

¹ It is easily shown that this argument remains valid when only part of profits is retained and the remainder is distributed.

Let k be the proportion of profits which is distributed

$$S=f(R, k\pi)+(1-k)\pi$$

This is a maximum when

$$\frac{\partial S}{\partial x} = \frac{\partial f}{\partial R} \cdot \frac{\partial R}{\partial x} + \frac{\partial \pi}{\partial x} \left[k \left(\frac{\partial f}{\partial k\pi} - 1 \right) + 1 \right] = 0.$$

Given π , this is a maximum with respect to k when $\frac{\partial f}{\partial k\pi} = 1$.

∴ We have once again the general maximum condition

$$\frac{\partial f}{\partial R} \cdot \frac{\partial R}{\partial x} + \frac{\partial \pi}{\partial x} = 0.$$

positive; but it does not account for the behaviour of firms which produce outputs higher than those required to maximize profits, and yet do not raise funds from the capital market, and for whom presumably $\frac{\partial f}{\partial R} = 0$.¹ If it were proposed to apply it to such firms, then it already stands refuted. However, it does have the slight advantage within the general context of this discussion, namely, that as long as firms do not wish to maximize capital available for growth, they are not obliged either to maximize profits or revenue. In other words, if other considerations led to some specified preference function for the firm, such considerations would not necessarily be in conflict with what would be required by the operations of the capital market.

OLIGOPOLISTIC INTERDEPENDENCE

As has been pointed out earlier the output which yields maximum short-run profit will be related to the firm's estimate of its marginal revenue curve. In an oligopolistic situation, therefore, it is impossible to determine whether a specified output variation will lead to higher profits without making some assumption of the effect competitors' reactions will have on marginal revenue. Should a firm appear to be operating at a higher level of output than that yielding maximum profits, this may be simply because the entrepreneur and the investigator differ as to the position of the marginal revenue curve and the nature of the competition facing the firm.

It is of interest to see what this implies for the case of a firm in the type of market situation studied by Cournot. The model may be set out as follows:

$$(7) \quad P = P(x_1, x_2).$$

$$(8) \quad C = C(x_1).$$

$$(9) \quad x_2 = x_2(x_1).$$

where

P = the price quoted by firm 1 for output x_1 .

x_2 = the output produced by all other competitors.

C = total cost of firm 1.

Equation 9 indicates how firm 1 expects its competitors' output to react to variations in its own output.

Maximizing profit (equal to $x_1 P(x_1, x_2) - C(x_1)$), we have

$$(10) \quad P + x_1 \frac{\partial P}{\partial x_1} + x_1 \frac{\partial P}{\partial x_2} \cdot \frac{\partial x_2}{\partial x_1} = \frac{\partial C}{\partial x_1}$$

where $P + x_1 \frac{\partial P}{\partial x_1}$ is the marginal revenue function when x_2 is ignored.

Assume that $\frac{\partial P}{\partial x_2}$ is negative so that increases in competitors' output

¹ If $f(R)$ is assumed to be defined for what might be called the "very long run", it has all the difficulties of testability of hypotheses said to apply in the long run mentioned *supra*, p. 131.

lead to lower sales by firm 1 at any price. The sign of $x_1 \frac{\partial P}{\partial x_2} \cdot \frac{\partial x_2}{\partial x_1}$ will then be the opposite of the sign of $\frac{\partial x_2}{\partial x_1}$.

Suppose $\frac{\partial x_2}{\partial x_1}$ is positive, that is, that firm 1 assumes that its output policies will be followed by its competitors. In this case its marginal revenue curve will lie to the left of its marginal revenue curve when x_2 is ignored, and its output will be lower. Moreover, the greater $\frac{\partial x_2}{\partial x_1}$ is in absolute value, the smaller will be its output.

Conversely, if $\frac{\partial x_2}{\partial x_1}$ is negative, that is, firm 1 assumes that its output policies will be followed by opposite policies by its competitors, then the greater $\frac{\partial x_2}{\partial x_1}$ is in absolute value, the greater will be its output.

Thus, differences in the sign and magnitude of $\frac{\partial x_2}{\partial x_1}$ will lead to different estimates of the price and output policy which will maximize profits.¹ Empirical investigators may elucidate individual cases where firms mistake the nature of their market conditions, and it may be that they consistently underestimate the magnitude of competitors' reactions. On purely theoretical grounds, however, it would scarcely seem to be true that oligopolistic interdependence will lead firms necessarily in the direction of revenue maximization.

IGNORANCE OF THE REVENUE FUNCTION AND VARIATIONS IN TECHNOLOGY

The hypothesis that firms do not maximize short-run profits may be interpreted in two ways. It may mean that firms reject known opportunities to make profits in favour of other objectives, or it may mean that the firms find themselves in situations of ignorance in which they consistently finish up making smaller profits than if they had been better informed. So far the analysis here has been mostly pertinent to the first interpretation,² but it is of interest to consider the consequences of the second. It is obvious that the less the firm knows about its revenue function the smaller profits it will make. The question is: Is it likely that it will make these smaller profits by producing an output higher than that which will maximize profits?³

¹ In general, of course, the model discussed here is too simple, but it is easy to construct more complicated models, which include the kind of strategic elements studied in the theory of games, and which are equally inconclusive.

² It is this interpretation which Baumol adheres to, *vide* "On the Theory of Oligopoly", p. 187. The behaviour of oligopolists discussed in section III, is, of course, partly based on ignorance or faulty estimation of the marginal revenue curve.

³ A minor point to be noted is that in full-cost pricing over the range of constant average variable costs once the firm has decided its price or profit markup, profit maximization and revenue maximization amount to the same thing.

Consider the case of an organisation which is not well informed of the revenue possibilities confronting it. It may not maximize profits for any or all of the reasons mentioned so far, long-run considerations and entry into additional markets, growth, oligopolistic interdependence, and ignorance. But there is one additional factor which appears to lead it in the direction of revenue maximization. That is that the cost function of the firm is unlikely to be fixed over time. Indeed, it may be said that the greatest weakness of received theory lies in its assumption of a fixed technology operated at maximum efficiency. If this assumption is rejected to be replaced by one in which an important part of the firm's activities is devoted to the reduction of operating costs, then a strong force acting in favour of maximization of sales emerges. This is that the higher the levels of established sales, the greater is the advantage to be derived from the cost reduction.

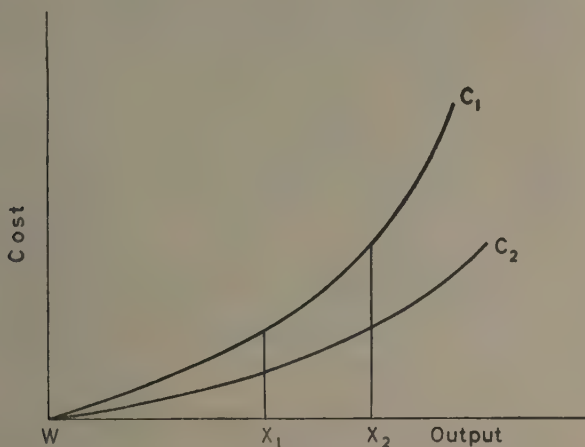


Fig. I

It is assumed that the firm's estimate of its revenue possibilities is subject to great error. Its total variable cost curve is expected to fall over time partly because of additional factor inputs (for example, in research and management) but also partly as a result of improved technical information which is available free. Thus, on the one hand it may discover an improved manufacturing technique, and, on the other, it may come to hear of new methods of production planning or inventory control.

The effect of these is that the decision makers do not plan solely on the basis of an existing cost function, but also take into account a future cost function. If the improvements involve (say) a proportionate reduction in total cost for every level of output, then the larger the level

of established sales, the larger will be the saving in cost and the addition to profit resulting from the shift in the cost function. Therefore, if there is not much information available on the revenue side to help determine the optimum output, it seems likely that the firm will produce a larger output yielding greater revenue than if the revenue function were better known or the cost function were not varying over time.

In figure 1, C_1 is the firm's present total variable cost function, and C_2 is a potential new total variable cost function. Although it is possible that given C_1 , x_1 will be a more profitable output, if C_2 becomes the new cost function, the gain in profits will be greater from selling x_2 than from selling x_1 .

Clearly, this factor will not guarantee that x_2 will be chosen over x_1 since the firm may consider the possible profits from the sale of x_1 to be so high relative to those from x_2 without a change in costs that it can afford to ignore future potentialities. Moreover, it would not necessarily lead it to choose the largest output the revenue from which is expected to cover total cost (or total cost plus a minimum markup). It does, however, seem to act as a force in that direction.¹

In examining alternative hypothetical explanations of the failure of firms to maximize short-run profits the only fairly safe conclusion that seems to follow from the elementary analysis employed here is that there are many good reasons why that should be the case and that the pursuit of other objectives has a fairly high plausibility. Unfortunately, although several factors have been discussed which might give rise to revenue or sales maximization being a primary objective, none of these provide a theoretical guarantee of this, so to speak. Some of them, however, do seem to have sufficient empirical content to be susceptible to testing and further analysis.

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¹ It must be stressed that this argument is not to be interpreted as saying that the firm does not want to maximize profit. It is merely concerned with the consequences of its inability to maximize profit in conditions of ignorance.

Factor Endowments and Factor Prices¹

By A. H. LAND

It is a well established theorem that under certain assumptions free trade in commodities will equalise the prices of the factors of production, even although the countries entering trade are differently endowed with factors and there is no international migration of factors.² The purpose of this paper is to present a simple geometrical demonstration of the theorem under the strict assumptions, and to illustrate how the theorem breaks down when the number of commodities exceeds the number of factors.

The strict assumptions under which the theorem is true are:

- (1) There are only two commodities (food and clothing).
- (2) There are only two factors (land and labour) both entering into the production of both commodities in linear and homogeneous production functions.
- (3) There is diminishing marginal productivity throughout of both factors in the production of both commodities.
- (4) Food is more land intensive than clothing at every factor price ratio.
- (5) Land and labour are the same in both countries, therefore the production functions are the same in both.
- (6) There is perfect product mobility but no factor mobility.
- (7) Both countries are still producing both commodities in equilibrium.

¹ The idea for this paper arose out of discussions with H. W. Kuhn, G. Morton, and M. H. Peston, at The London School of Economics.

² P. A. Samuelson, "International Trade and the Equalization of Factor Prices," *Economic Journal*, vol. LVIII (1948), p. 163; "International Factor-Price Equalization Once Again," *Economic Journal*, vol. LIX (1949), p. 181; "Prices of Factors and Goods in General Equilibrium," *Review of Economic Studies*, vol. XXI (1953-4), p. 1. J. Tinbergen, "The Equalization of Factor Prices between Free Trade Areas," *Metroeconomica*, vol. 1, fasc. I (1949), p. 39. J. E. Meade, "The Equalization of Factor Prices: The Two-country Two-factor, Three-Product Case," *Metroeconomica*, vol. II, fasc. III (1950), p. 129. S. F. James and J. F. Pearce, "The Factor Price Equalisation Myth," *Review of Economic Studies*, vol. XIX (1951-52), p. 11. A. P. Lerner, "Factor Prices and International Trade," *Economica*, vol. XIX (1952), p. 1. T. M. Rybczynski, "Factor Endowment and Relative Commodity Prices," *Economica*, vol. XXII (1955), p. 336. R. W. Jones, "Factor Proportions and the Heckscher-Ohlin Theorem," *Review of Economic Studies*, vol. XXIV (1956-57), p. 1. Romney Robinson, "Factor Proportions and Comparative Advantage," *Quarterly Journal of Economics*, vol. LXX (1956), p. 169 and p. 346. H. G. Johnson, "Factor Endowments, International Trade and Factor Prices," *Manchester School of Economic and Social Studies*, vol. XXV (1957), p. 270. K. Lancaster, "The Heckscher-Ohlin Trade Model: a Geometric Treatment," *Economica*, vol. XXIV (1957), p. 19. R. F. Harrod, "Factor-Price Relations under Free Trade," *Economic Journal*, vol. LXVIII (1958), p. 245.

In any country the isoquants can be represented as in Fig. 1:

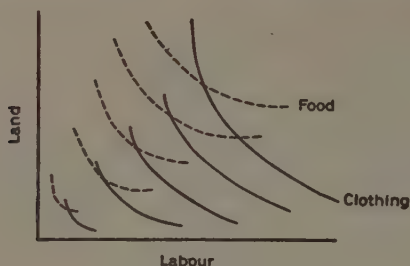


FIGURE 1

For any *given* set of commodity (food and clothing) prices, each country will be in equilibrium only if it is maximizing its total revenue from production (regardless of its consumption pattern).

Suppose that we know the equilibrium commodity prices. To avoid introducing a "money" commodity let us take food as the *numéraire* of prices. Then we can draw the isoquant associated with one unit of food and the clothing isoquant for that quantity of clothing which is equivalent to one unit of food (as in Fig. 2).

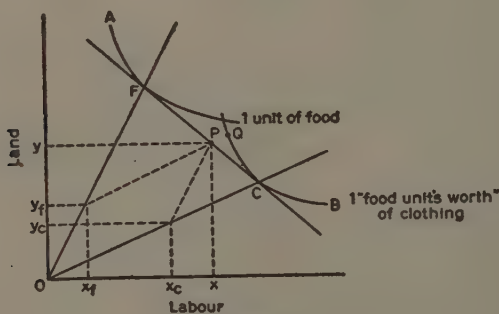


FIGURE 2

The line AFCB is the one unit iso-revenue curve for the given commodity prices. A quantity y of land and x of labour can earn one unit of revenue if y_c and x_c are devoted to clothing production, and y_f and x_f devoted to food production. This is more than could be obtained by the factor combination (y, x) devoted to either food or clothing alone. The unit level iso-revenue curve is the envelope curve of the individual unit level isoquants, and it is necessarily convex. The parts of the individual isoquants lying above and to the right of the iso-revenue curve represent inefficient production processes at the given commodity prices. The point Q on the clothing isoquant, for

instance, would not be used since it would yield only one unit of revenue, whereas the same quantity of land and labour devoted to producing food in the factor combinations shown by OF plus clothing in the factor combinations shown by OC would yield a revenue greater than one.

Since the individual commodity production functions are linear and homogeneous, so also is the revenue-production function for the given commodity prices. AFCB is one of a continuous series of similar contour lines.

Any country with factor endowments lying between the ratios OF and OC will maximize revenue from production by combining food production and clothing production each using factors in the proportions OF and OC.

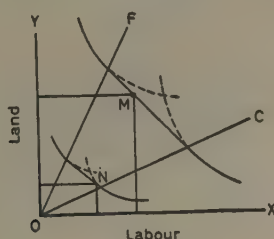


FIGURE 3

For example, the two countries with quantities of factors shown by the points M and N in Fig. 3 would each maximize revenue by producing food and clothing at the factor proportions OF and OC.

The same idea can be expressed in another way. As the proportions of the factors vary from OY through OF and OC to OX, substitution of land for labour between the ratios OY and OF first occurs by producing only food, and substituting along the food isoquant. Between the factor ratios OF and OC, substitution is between the two products, each being produced with constant factor ratios. Between OC and OX only clothing is produced and technical substitution between factors again occurs.

The factor price ratio is determined by the slope of the tangent to the iso-revenue curve at the point corresponding to its factor endowment. This ratio will be the same for any countries whose factor endowment ratios lie in the straight line section of the iso-revenue curve, between OF and OC.

The analysis is not dependent on there being only two countries. All that we have assumed is that equality of commodity prices has been reached by international trade. Any number of countries may be optimizing with respect to those prices, some specializing entirely on food or on clothing at different factor prices, and others producing both at equal factor prices.

A shift in the commodity price ratio will change the iso-revenue curve and hence the factor price ratio, but will result in a similar picture.

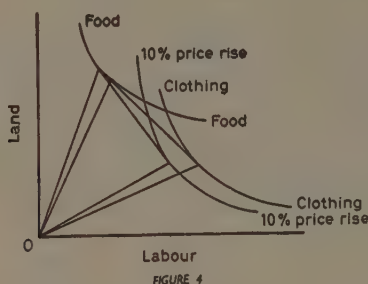


FIGURE 4

For example, a 10 per cent. rise in the price of clothing relative to food would select a clothing isoquant 10 per cent. nearer the origin as part of the iso-revenue curve, and hence increase the price of labour relative to the price of land (Fig. 4).

The analysis will extend to n factors so long as there are exactly n commodities, each of which is more intensive in the use of one factor than all the others.¹ However, if there are fewer than n such commodities there will be no determinacy of factor prices.

A serious limitation of the theorem appears when we consider the case where there are *more* commodities than the number of factors.

In the two-factor case suppose there is a third commodity using the factors in proportions intermediate between food and clothing. If it is to be relevant at all we must assume that equilibrium commodity prices are such as to make that commodity appear somewhere on the efficient boundary of the revenue-production function, otherwise no country would wish to produce it. However, there seems to be no reason to suppose that the price of the third commodity should be such as to make the one-revenue-unit isoquant lie exactly on the straight line section between the other two one-unit isoquants; i.e., we assume that Fig. 5a represents the typical case, rather than Fig. 5b.

Thus the addition of a third commodity may narrow the limits of the factor endowment ratios in which countries may have equal factor prices to the range between OF and OX_1 or between OX_2 and OC. Where there are more than n commodities (n being the number of factors) free trade will lead each country to produce not more than n commodities, factor price equalization being achieved only between countries which happen to produce the same set of n commodities. In other words, factor price equalization depends on there being a gap in the spectrum of commodities in terms of their intensities of use of

¹ See the Appendix by H. W. Kuhn,

factors, great enough to accommodate the differences in factor endowments of the countries being considered.

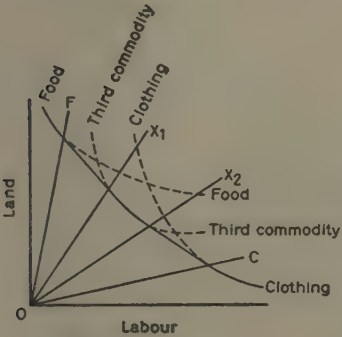


FIGURE 5a

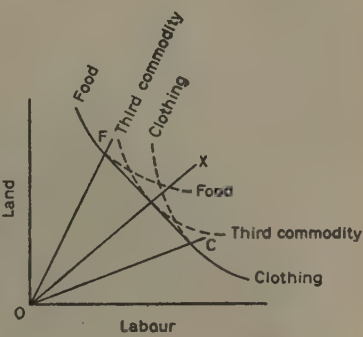


FIGURE 5b

As soon as there are more than two commodities (in general, more than n) it is easy to conceive of a situation where free trade can result in a greater divergence in factor prices than the absence of trade (Fig. 6).

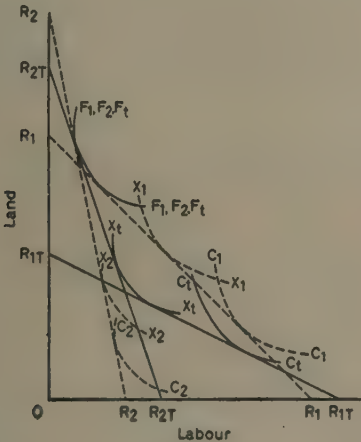


FIGURE 6

Suppose that before trade country 1 was in equilibrium at factor price ratio R_1 producing all three commodities. The prices of the commodities would have to be such as to make F_1 , X_1 and C_1 the unit revenue isoquants. Similarly, before trade, country 2 is in equilibrium at factor price ratio R_2 with unit revenue isoquants F_2 , X_2 and C (one

unit of food is taken throughout as the *numéraire*). Without specifying demand conditions the equilibrium free trade commodity prices are unknown. But any commodity prices between the original pre-trade prices are conceivable equilibrium values. Thus we may assume that, with trade, C_t and X_t represent the quantities of X and clothing equivalent to one unit of food. Then equilibrium may be arrived at with country 1 partially specializing in clothing and X at factor price ratio R_{1T} and country 2 partially specializing in X and food at factor price ratio R_{2T} . The difference between the ratios R_{1T} and R_{2T} is greater than the difference between R_1 and R_2 .

This is an extreme case, but in general the denser is the spectrum of commodities in terms of their factor intensities, and hence the closer the iso-revenue curve approaches to a smooth curve, the less meaningful is it to speak of factor prices being equalized by trade in commodities.

Joint production has a similar effect in making the iso-revenue curve for any particular set of commodity prices more of a smooth curve, and so has the removal of assumption 4.

Thus without even considering the validity of constant returns to scale or the qualitative identity of factors in different countries, we see that the application of the theorem of factor price equalization depends on the special straight line character of the iso-revenue curves for equilibrium commodity prices, and that this property disappears as soon as there are more than n commodities, each being more intensive throughout in one of the n factors, or as soon as commodities are produced jointly. Furthermore, there does not even remain any discernible *tendency* towards greater equality of factor prices when trade takes place.

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MATHEMATICAL APPENDIX

By

HAROLD W. KUHN

The preceding paper discusses an equilibrium in which factor prices are determined when commodity prices are given. In the case of two goods and two factors, the existence of the factor prices is intuitively obvious and amounts to the existence of a common tangent to certain commodity iso-quants (see Fig. 2 above). The purpose of this Appendix is to provide a rigorous demonstration of the existence of equilibrium factor prices in the general case of n goods and n factors of production. For ease of comparison we shall employ the notation of Samuelson's definitive treatment¹, which does not contain an existence proof.

¹ Paul A. Samuelson, "Prices of Factors and Goods in General Equilibrium," *Review of Economic Studies*, vol. XXI (1953-54), pp. 1-20.

Let n goods be produced in amounts $X_1, \dots, X_n$ using n factors of production and let V_{ij} denote the amount of the j th factor used in the production of the i th good. Inputs per unit of output will be denoted by $a_{ij} = V_{ij}/X_i$. The production functions,

$$X_i = X^i(V_{i1}, \dots, V_{in}) \quad (i=1, \dots, n) \dots \dots \dots (1)$$

are assumed to be concave homogeneous functions of the first order defined for all non-negative inputs. (A function is *concave* if linear interpolation between two values always yields a value not greater than the value of the function at the point of interpolation). Prices of goods are denoted by p_i ; prices of factors are denoted by w_j . For given factor prices, $A^i(w_1, \dots, w_n)$ denotes the minimum unit cost of good i , that is, the minimum value of $w_1 a_{i1} + \dots + w_n a_{in}$ subject to $a_{i1} \geq 0, \dots, a_{in} \geq 0$ and $X^i(a_{i1}, \dots, a_{in}) = 1$. As Samuelson has noted, these functions are continuous, concave, and homogeneous of the first order.

Given the production functions X^i and positive prices p_i for the goods, Samuelson has defined equilibrium as a set of non-negative factor inputs V_{ij} and non-negative factor prices w_j such that

$$w_j \geq p_i \partial X^i(a_{i1}, \dots, a_{in}) / \partial V_{ij} \dots \dots \dots (2)$$

for all i and j , where equality is to hold unless $V_{ij} = 0$.

It is known¹ that these are necessary and sufficient conditions for each set of non-negative factor inputs ($V_{i1}, \dots, V_{in}$) to achieve the minimum unit cost, $A^i(w_1, \dots, w_n)$, for the i th good at factor prices ($w_1, \dots, w_n$). Thus, the existence of an equilibrium may be formulated in the following terms, which apply equally well to non-differentiable production functions (arising, say, from a linear programming setting): given the production functions X^i and positive prices p_i for the goods, there exist a set of non-negative factor inputs ($V_{i1}, \dots, V_{in}$) and non-negative factor prices ($w_1, \dots, w_n$) such that

$$A^i(w_1, \dots, w_n) = w_1 a_{i1} + \dots + w_n a_{in} = p_i \dots \dots \dots (3)$$

for $i=1, \dots, n$.

This is a direct generalization of the graphical representation given in two dimensions. Namely, it asserts the existence of a hyperplane $w_1 V_1 + \dots + w_n V_n = 1$ in the space of factor inputs that is a common supporting hyperplane to the n closed convex sets formed by inputs such that $X^i(V_1, \dots, V_n) \geq 1/p_i$ for $i=1, \dots, n$. Contact is made between the hyperplane and the i th set at $(a_{i1}/p_i, \dots, a_{in}/p_i)$.

The existence theorem will be proved under the following INTENSITY HYPOTHESIS: There is an indexing of goods and factors (informally, associating each good with its intensive factor) such that $w_1 = 0$ implies $A^1(w_1, \dots, w_n)/p_1 < A^k(w_1, \dots, w_n)/p_k$ for some k . (Informally, this asserts that, if the factor that is used intensively in good i is free, then good i is not the most expensive to produce).

PROOF. For each non-zero set of factor prices, define $M(w_1, \dots, w_n) = \max_i A^i(w_1, \dots, w_n)/p_i$. Then, dropping the variables for conciseness,

$$w_i' = w_i + M - A^i/p_i \quad (i=1, \dots, n) \dots \dots \dots (4)$$

defines a continuous mapping of non-zero factor prices into themselves. By the Brouwer fixed-point theorem², there exist factor prices $w_1, \dots, w_n$

¹ H. W. Kuhn and A. W. Tucker, "Nonlinear Programming," *Proceedings of the Second Berkeley Symposium on Mathematical Statistics and Probability*, University of California Press, 1951, pp. 481-92; see Theorems 1 and 2, and Lemma 3.

² See, for example, S. Lefschetz, *Introduction to Topology*, Princeton University Press, 1949, p. 117.

and a constant $c > 0$ such that $cw_i = w_i + M - A^i/p_i$ for $i=1, \dots, n$. Choose some good i for which $A^i/p_i = M$. For this i , $cw_i = w_i$ and hence either $c=1$ or $w_i=0$. The possibility $w_i=0$ is ruled out by the Intensity Hypothesis. Therefore $c=1$ and $A^1/p_1 = \dots = A^n/p_n = M$. Hence the desired equilibrium prices are $w_1/M, \dots, w_n/M$. Q.E.D.

The question of uniqueness is delicate; sufficient conditions with a natural economic interpretation seem to be difficult to find. (Note that Samuelson's condition depends not only on the association of goods with factors but also on the ordering of the goods). We shall be content with recording one sufficient condition: for factor prices normalized so that $w_1 + \dots + w_n = 1$, $\sum_i (w_i' - w_i'') (A^i(w_i') - A^i(w_i''))/p_i > 0$ for all w' and w'' . (Informally, this is a generalization of monotonicity and says that the effect of the unit costs that move in the direction of a change in factor costs outweighs the effect of unit costs moving in the opposite direction). The proof is immediate; if we choose w' such that $A^i(w')/p_i = M(w')$ and note that $\sum_i (w_i' - w_i'') = 0$ for all w'' , then $A^i(w'')/p_i \neq M(w'')$ for at least one i . Hence, if w' defines an equilibrium then w'' does not.

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Inflation and Long-run Growth¹

By J. BLACK

This note attempts to clarify the relation between Keynesian short-run theories of the determination of changes in incomes and employment by variations in effective demand, and theories of long-run economic growth which have usually attached much more importance to the growth of supplies of available factor services. The apparent gap between the two types of theory cannot satisfactorily be removed by belittling the short-run relation between the level of monetary demand and incomes on which Keynesian analysis concentrates; this is indeed the principal burden of the Keynesian criticism of the "Classical" position. Equally, however, it is desirable to find an escape from the projection into the long run of Keynesian short-run analysis, which if carried out rigorously leads to the extreme position that real growth without a proportional expansion of monetary demand is somehow logically impossible.

What is needed is an analysis of the long-run relation between monetary demand and real output which will leave room in its logical structure for either the Keynesian or the Classical position, making the choice between them essentially a question of empirical judgement of the sizes of parameters in particular economies. The analytical method adopted below for this purpose is an improvement upon the form of the aggregate supply function often used in the theoretical analysis of both economic growth and inflation. The discussion will be confined to the simplest case, that of a closed economy. It will also assume that the problems involved in adjusting the growth of the capital stock to that of the labour force have been satisfactorily solved, so that "full employment" and "full capacity output" as used below will be taken to occur simultaneously. (This is of course unrealistic; it is the very fact that such adjustments take place in jerks which gives rise to many of the inflationary problems of an economy at or near full employment.)

The model of the aggregate supply function developed below shares with other such models the basic postulate that the "aggregate supply curve" of goods is neither perfectly elastic nor perfectly inelastic, save at extreme ranges of variation of output, but is of varying, finite, degrees of elasticity. Thus, starting from a slump position, an increase

¹ The author owes much of the stimulus behind this article to some public lectures given at Oxford in Autumn, 1957, by Professor W. Fellner, and to private conversations with P. P. Streeten and J. Knapp. He is indebted for comments and suggestions to Professor A. W. Phillips, G. D. N. Worswick and L. Klein; none of these, however, is in any way responsible for the views expressed.

in the level of effective demand, measured in terms of money, will at first serve mainly to stimulate output; but its effects will gradually change as full employment is approached, so that eventually its effect is to increase only prices and wages. Throughout this article monetary effective demand is taken to be measured by actual expenditure, frustrated demand being excluded (i.e., unfulfilled *ex-ante* intentions to purchase are ignored, although under inflationary conditions they are in fact likely to be important).

An aggregate supply curve which rises from left to right may be taken to reflect the need, at high levels of employment, to make use of factors of production which though of low efficiency have to be given standard rates of pay; the need to employ factors under conditions of decreasing returns; and the stronger bargaining position of the sellers of both goods and labour as full employment is approached. The average level of prices in the economy as a whole also tends to rise as full employment is approached because in a changing economy the proportions between the productive capacities of different industries, and the composition of the labour force, are never perfectly adapted to the pattern of demand at or near full employment; thus some industries tend to reach full capacity before others.

The effects of excess demand for the products of one industry, or for the services of one group of workers, will, of course, be affected by the institutional methods of price and wage determination; but other things being equal, the process of cost-inflation appears to work somewhat as follows. Price increases tend to begin in the industries where "bottlenecks" first appear as aggregate demand approaches the full employment level; and the increases spread via their effects on industries which are sufficiently close to full capacity production for the effects of increases in costs to be passed on to their customers, or via groups of workers sufficiently close to full employment for increases in the cost of living to result in wage claims, which are then conceded, the resulting increases in costs again being passed on by the employers in the form of increased prices.

If the aggregate supply function used is of the form in which the level of prices is simply plotted on the vertical axis against the level of employment or output on the horizontal axis, it is open to the objection that this may be taken to imply that the process of inflation, in which increasing monetary effective demand pushes the economy up a rising supply function, can be reversed along the same path; i.e., that a downward movement of effective demand will be reflected in price and output reductions in the same proportions as the increases in prices and output brought about by a rise in effective demand in money terms. If there are price, and more especially wage, rigidities, however, such an assumption may be highly misleading as a guide to policy. The simplest way of expressing non-reversibility of the supply function is to make the vertical axis of the aggregate supply curve measure, not the absolute level, but rather the rate of change of prices.

Thus where F in figure 1 is the level of output corresponding to full employment, the aggregate supply curve approaches the full-employment mark rising asymptotically. Above some critical level C , extra demand can be satisfied only at the cost of a tendency for prices to rise cumulatively. Below the level C , prices are stable, but it may if desired be assumed that below some slump level S a tendency to falling prices and wages sets in; (any reader who doubts the existence of the flat section between S and C is referred to figure 2). The form of the aggregate supply function as adapted thus shows that the process of inflation is not simply reversible.

It must be admitted that the use of the name "aggregate supply curve" for the function shown in figure 1 is open to objection, since whereas a supply curve in the Marshallian sense is a curve showing the quantity of the supply of goods which will be forthcoming at any given price, or alternatively the price which will be needed to induce producers to supply any given quantity, the curve in figure 1 does not display a relation of this sort, but indicates rather the behaviour of prices over time which will result from any given level of employment. The author's excuses for continuing to refer to it as an aggregate supply curve or function are that it looks like the old aggregate supply curve; that its place in the analysis of inflation is similar; and that he is unable to think of any other name which suggests its actual function adequately.

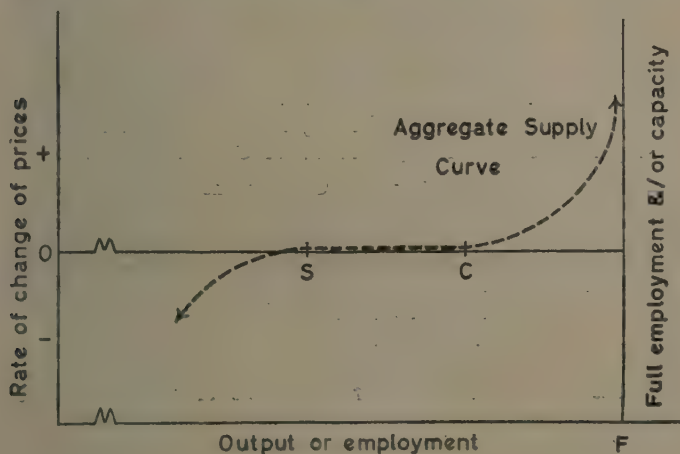


Fig. 1

In what follows it will be assumed that the form of the aggregate supply function is such that there is a tendency for the economy to approach a stable equilibrium, either in the sense of some static level of output and prices, or in the sense of a tendency to settle down to a

constant rate of change (rates of change as used below always being proportional). It is apparent that a given, once for all, change in the level of monetary effective demand cannot permanently maintain output to the right of C nor depress it to the left of S. A given percentage rate of change of effective demand in terms of money, however, must eventually make output settle at the level at which the rate of increase of prices is equal to the rate of growth in money terms of effective demand. It must be noticed that the level and rate of growth of effective demand in money terms are taken as autonomous variables; the justification for this is that demand can be affected, at the margin at least, by monetary and fiscal policies. As it is the effects of such policies on the growth of incomes and prices in an economy which we really want to analyse, we are justified in treating the growth of monetary demand as an autonomous variable, at least within certain limits.

The model outlined above is based on extremely static assumptions, but these can be modified in two ways to make it more generally applicable. First, the long-run effects of the growth of factor supplies and of investment on the full-capacity level of output can be allowed for by letting F shift to the right over time, the supply curve shifting horizontally with it. The growth of F may be expected to proceed at some trend rate T, reflecting the growth of population and the effects of technical progress, *plus* an increasing function of the level of investment over some past period. Second, the position of the supply curve can be made to shift vertically in a way determined by the rate of change of the price level over some past period. This implies that as both buyers and sellers get attuned to regarding a given rate of increase of prices as normal, and come to expect it to continue, the whole supply curve shifts upwards. Such a shift may affect the whole schedule, or only the proportions to the right of C; or C itself may move to the left, so that with expectations of rising prices and wages, such rises may in fact be induced at a lower level of employment and output than was required to produce the increases when expectations were formed in the light of a recent experience of price and wage stability. It is possible also that the effects of increasing productivity may make possible falling commodity prices at some levels of output, consistently with rising or constant factor prices. In making these adjustments, to allow for the effects on the aggregate supply curve of the growth of full-capacity output, and to allow for the effects of price expectations, the lag periods, and the weighting of different parts of the periods, must be chosen to fit the type of economy concerned.

It is now possible to examine the effects on the growth of output and prices of letting total monetary demand increase at any given rate (the reasons for rejecting the more orthodox method of adding to the model some function relating effective demand to earlier levels of income via the multiplier and accelerator mechanisms were discussed above). For this purpose it is convenient to set up a special case of the aggregate supply function, in which it is assumed that the function

takes the form of a rectangular hyperbola asymptotic to the full-employment level F , and to a rate of change of prices Q . $\dot{Q}$ will normally lie below the zero-price-change level, except in circumstances of inflation when it may be that no cut in the level of activity could bring price rises to a halt at once. It need hardly be emphasised that this case is chosen for illustrative purposes only, although over much of its range the curve shown in figure 2 appears not implausible.

✓ The advantage of this special case is that the various forces we have been considering can be summed up in three parameters which may be taken either as constants, or as labels for functions; they are in any case useful for reference in what follows.

They are (1) A , the area between any one point Y on the hyperbola and its asymptotes ($A = WXYZ$). The size of A will depend on various institutional factors, such as the mobility of workers between different industries, which affect the level of aggregate demand at which bottle-

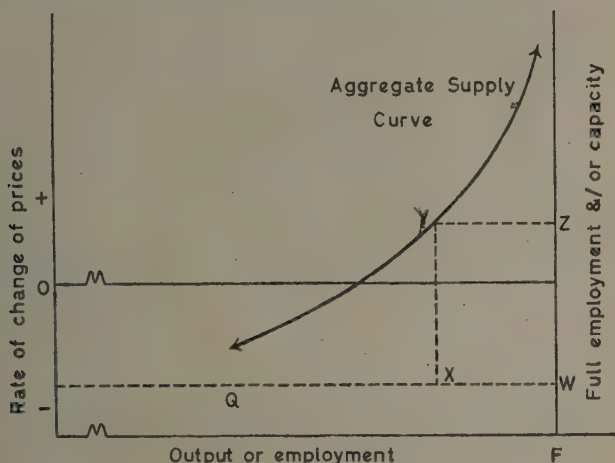


Fig. II

necks are likely to arise; the strength or weakness of general fears of inflation; and the strength of market imperfections generally.

(2) I , the investment-function, which relates the rate of growth of full capacity output, and thus the horizontal shifts in the aggregate supply curve, to previous levels of actual output. This assumes that there is a unique relation between output and investment at any one time, either via the multiplier or via induced—but *not* accelerator-type—investment.

(3) P , the price-expectations function, which relates vertical shifts in the aggregate supply curve to the price changes experienced by price and wage setters in recent periods.

What then are the effects of variations in the rate of growth of monetary demand? If it grows too fast, a rising price trend is set up, which raises the aggregate supply curve so that a continuation of the same rate of increase of aggregate demand in subsequent periods tends more towards producing increases in prices, and less towards the stimulation of extra output. On the other hand a stimulation of output in any one period tends to increase investment, and thus the full capacity output of later periods, so that the supply function shifts to the right. If monetary demand grows too slowly, a falling price level may follow; but this is only possible with a low rate of actual output compared with capacity at any one time, which in turn hinders the growth of full capacity output in subsequent periods. In this case, however, if the expectation of falling prices shifts the aggregate supply curve downwards, this will tend to offset the effects of the low level of monetary demand on the growth rate of real output. If a low level of production in any one period tends to decrease induced investment, then it will hinder the growth of productive capacity in subsequent periods, and tend to make stagnation chronic.

With any given set of values of the parameters A , I and P , discussed above, it is possible to enquire whether there exists some optimum rate of growth of monetary demand, which will serve in the long run to maximise the rate of growth of actual output; and whether, if such an optimum rate exists, it need involve any tendency for prices to increase at all. If we consider the state of affairs which will prevail in each successive period once any given constant rate of growth of monetary demand has become established, this rate will be equal to the sum of the rates of growth of output in real terms, and of the level of prices (this equality is exact if the rates are measured instantaneously; over any short finite period it is a good approximation). The position of the aggregate supply schedule in any period, however, will itself reflect the effects of earlier price changes on price expectations, and that of earlier levels of activity on investment and the growth of productive capacity. The optimum rate of growth of monetary demand, if there is one, will be that which brings the economy to a position such as Y in figure 2, at which the beneficial effects of a faster rate of growth of demand in shifting Y up the supply schedule, *plus* the effects of a shift to the right in the schedule because of increased investment in previous periods, just balance the adverse effects on the level of output at any time *via* the upward shifts in the schedule due to price increases in earlier periods.

Two factors may make for conditions which favour the existence of such an optimum point. Price expectations may be elastic, so that once price changes have begun they are expected to get faster, which means that P is high, and a persistent attempt to encourage output by increasing monetary demand leads rapidly to hyper-inflation. The other favourable factor is that at some high level of output, relative to full employment, a further increase in demand may tend either to

decrease the amount of investing done, or to lead what investment there is to be so misdirected that its effectiveness in increasing productive power is reduced. Some trade cycle theories, notably that of Hayek, have suggested that this will be the case under extreme boom conditions. If neither of these conditions is fulfilled, then it may always be possible to stimulate a faster rate of growth of real output by increasing the rate of growth of monetary demand. The rate of growth of real output which can be produced will itself tend to a finite limit, however, and any extra growth of real output is purchased at the cost of a faster inflation of prices, involving effects on income distribution, etc., which may make faster growth not worth its social costs after some point.

Whether the optimum rate of growth of monetary demand, if there is one, implies rising prices at all depends on the details of the assumptions made about the different parameters for the economy in question; but common sense suggests that it will probably involve some price increases. The smaller is A , with any given values of I and P , the less unlikely it becomes that the maximum rate of growth of output is compatible with stable prices. If we consider the related problem of how it is possible for growth of real output to take place in conditions in which total effective demand in money terms is not increasing, or is growing very slowly, we find that the possibility of real expansion again depends on the form of the functions shown by I and P . The assumptions most favourable to the possibility of real growth under these circumstances are a low value of A , which makes high levels of output compatible with stability of prices; a low I , which means that the growth of capacity depends only slightly on the types of investment most affected by the relation between present output and existing capacity; and a high value of P , which means that price falls in one period affect price expectations so that a greater fall in prices in the next period is acceptable at any given level of output, and the supply schedule is moved downwards. Under these conditions an economy with stagnant monetary demand may grow in real terms little, if at all, more slowly than it would under more buoyant demand conditions, even though the level of output at any one time may be further below full capacity output than in the case of growth with a higher rate of increase of monetary demand.

It is also possible that the opposite conditions may prevail, however; the growth of capacity may be strongly hindered or even prevented entirely by low current levels of output and profits. This will occur if the supply schedule for any given period cannot readily be shifted downwards as the result of price cuts in previous periods; and if the prevalence of immobilities and market imperfections results in a high level of A , so that at any one time a high level of employment is possible only with rising prices. Under these conditions a serious slowing down of the rate of growth of real output, or even complete stagnation, may result if the level of monetary demand does not increase sufficiently.

In a model involving time-lags, the size of the optimum rate of expansion of monetary demand will be affected by the relation between the length of the lags in the effect of current output levels on future capacity, the *I*-function; and those of the lags in the effects of current price changes on price expectations and the height of the aggregate supply schedule, the *P*-function. The most favourable case for a rapid expansion of monetary demand being good for real growth is that in which capacity adjusts rapidly and price expectations adjust relatively slowly.

The implications of a model of this kind for the monetary and fiscal policies most conducive to a high rate of growth of real incomes depend on what values of the various parameters we regard as being most realistic, with reference to the particular economy under consideration. It is arguable that "Classical" economists would have held, had they been asked, and had they consented to discuss the matter in these terms, that *A* was in fact low, and ought if possible, to be made still lower by means of public policies encouraging competition and mobility; that price expectations were elastic, i.e., that *P* was large; and that investment depended chiefly on the long-run productivity of possible investment projects relative to the rate of interest on the money borrowed to finance them, and very little on short-run profit prospects based on current output levels, i.e., that *I* was small. Thus in even a moderately short run, a slower rate of increase of monetary demand would do very little to hinder, and a faster increase of monetary demand could do little to assist, either the growth of productive capacity or the attainment of a high level of output and employment at any one time. This is in effect a dynamic version of the quantity theory of money.

Believers in a more Keynesian approach to problems of long-run growth can argue, however, that the facts in the economies whose growth they wish to stimulate are that the elasticity of expectations concerning prices is low; or much more plausibly, that the growth of capacity is highly dependent on induced investment, based on profits prospects encouraged by a current high rate of output, and the availability of capital based on the existence of current high profits. Thus increasing monetary demand faster can at least up to a point do a great deal to promote development; and deflation, or stagnation in the growth of monetary demand could prove a great hindrance to real growth. The Keynesians would probably hold also that *A* is too high, owing to institutional factors; but would maintain that in many restriction-bound economies a prolonged experience of high levels of employment is itself the most effective remedy for the structural problems, such as rigid demarcation practices by labour, which have tended in the past to keep *A* high.

The chief lesson of the foregoing analysis, however, is that at the level of abstraction concerned, Keynesian and Classical theories concerning the role of increasing levels of monetary effective demand in

promoting long-run growth in real output are equally coherent so far as their mere logic is concerned. The only way of deciding which, if either, is of more assistance in understanding what monetary and fiscal policies are best suited to encourage real growth in any actual economy is to look at the facts about its market imperfections, pricing policies, and investment decisions, and see whether the Keynesian or Classical model fits them better.

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Productivity-Geared Wage Policies—A Comment

BY W. PETERS

A recent article in this journal¹ uses a model of a two-sector economy with cost-determined prices to suggest conclusions about the wages policy appropriate to an economy in which productivity is increasing at different rates in different sectors. The model used, however, excludes changes in the relative demands for different products arising from increases in real income.² It will be argued in this comment that this exclusion makes the model defective as a guide to policy, because such changes may be as significant as, and more predictable than, the changes in relative demands arising from changes in relative prices.

The working of Mr. Lancaster's model may be illustrated by considering first the case where there is no mobility of labour between the two sectors, *A* and *B*.³ If then productivity increases more rapidly in *A* than in *B* but there is no change in the price relationship between *A*-goods and *B*-goods (i.e., wages rise with productivity in each sector), there must be a tendency to an excess supply of labour in *A* relatively to *B*; for on the assumptions of the model the relative demand for *A*-goods and *B*-goods cannot change if there is no change in the price relationship, but the labour requirements per unit of output fall more in *A* than in *B*. Labour mobility in response to wage differences would make the imbalance worse, not better, since labour would be attracted from *B* to *A* by the more rapid increase of wages there. In order to cure the imbalance the "terms of trade" between sectors *A* and *B* must change, so that the consumption of *A*-goods is stimulated relatively to that of *B*-goods, and so that the tendency of labour to move from *B* to *A* is lessened or reversed.

It is not, however, legitimate to apply this argument directly in the discussion of actual problems, to conclude, for example, that a policy of adjusting wages in accordance with productivity increases in each sector "is not appropriate under any real, non-trivial circumstances". To do this it would be necessary to shew that the factors left out of account in the model, in particular the income effects, are either relatively unimportant or unlikely to be sufficiently systematic to affect the conclusion. Neither of these conditions appears to be fulfilled.

¹ K. Lancaster, "Productivity-Geared Wage Policies", *Economica*, August, 1958.

² The income elasticity of demand is assumed to be the same for the goods of each sector (p. 203).

³ In this case there is a strong similarity between Mr. Lancaster's problem and the problem, widely discussed in recent years, of the effects of different rates of productivity increase in two countries which trade with each other on the terms of trade between them. For this useful analogy and for other helpful comments the writer is indebted to Professor H. G. Johnson.

It is true that from year to year the "income effect" of rising productivity, i.e., the changes in relative demand resulting from increasing real incomes per head, will be small, simply because the percentage increase in the national income from year to year will be small. But what is significant is the relationship of this effect to the "substitution effect" on relative demand of changes in prices, brought about by increases in productivity and relative wage-rate changes.

Let us write x_a and x_b for the (small) relative productivity increases in the two sectors, and express the relative increase in real income as a weighted average of them: thus

$$\frac{dI}{I} = g.(x_a) + (1-g).x_b = \bar{x}.$$

It is then easy to derive the approximation

$$\frac{d\left(\frac{Z_a}{Z_b}\right)}{\frac{Z_a}{Z_b}} = (\eta_{la} - \eta_{lb})(\bar{x}),$$

where Z_a and Z_b are the demands for *A*-goods and *B*-goods, and where η_{la} and η_{lb} are the respective income elasticities.¹

This value for the proportional change in relative demand due to the income effect must be compared with the proportional change due to the substitution effect, approximated by $-\eta_s \left\{ \frac{dP_a}{P_a} - \frac{dP_b}{P_b} \right\}$, where $(-\eta_s)$ is the elasticity of substitution and P_a and P_b are the prices of *A*-goods and *B*-goods respectively. The price changes will, of course, depend upon both wage changes and productivity changes, but we can use for purposes of comparison the case where wages rise uniformly in all sectors.² In this case relative prices will vary in inverse proportion to relative productivities, and the substitution effect will be given by $\eta_s(x_a - x_b)$. We shall call this the "potential substitution effect" of a change in relative productivities. This must be compared with $(\eta_{la} - \eta_{lb})\bar{x}$.

Clearly there is no general presumption that the potential substitution effect must swamp the income effect. This can be illustrated even in the example in Mr. Lancaster's paper, where the elasticity of substitution is fairly high and where the rate of productivity increase in sector *A* is three times that in *B*. Suppose that the income elasticity of *A*-goods is 2 and that of *B*-goods is $\frac{1}{2}$. Then the potential substitution effect on relative demand is $2.(3\% - 1\%) = 4\%$. The income effect is $(2 - \frac{1}{2}).1\frac{2}{3}\% = 2\frac{1}{2}\%$, which can hardly be regarded as negligible:

¹ Of course, $g.\eta_{la} + (1-g).\eta_{lb} = 1$, unless we wish to introduce the complication of changes in the proportion of income saved as income changes.

² If we assume that normally there will be some tendency for wages to increase most rapidly where productivity is increasing most rapidly we can regard the change in relative productivities as an outside estimate of the change in relative prices.

with a different choice of values for the elasticities it could easily be made to exceed the substitution effect.¹

It seems, therefore, that conclusions about wages policy could legitimately be drawn from a model which ignored income effects only if it could be argued, for example, that in practice income effects were much less predictable or much less measurable than substitution effects, so that a policy based on the latter alone could be regarded as having the best chance of coming close to the ideal policy. But it is easier, if anything, to obtain information about income elasticities than about price elasticities, particularly when large sectors of the economy are under consideration. Furthermore there is reason to believe that within the field of manufacturing industry there is a correlation between high rates of increase in productivity and high income elasticities: if this is so it will be possible to associate wage increases with sectoral productivity increases more closely than the model suggests. Such a correlation may well not exist over the economy as a whole, because of the high income elasticity of services; but for the analysis of this sector a model based on the assumption of cost-determined prices is perhaps not very helpful.

University of Manchester.

A Further Note

By KELVIN LANCASTER

It is certainly true that differential income effects were excluded from my earlier analysis of productivity-geared wage policies, being explicitly and deliberately so excluded. This was done because, such effects depending solely on the relative income elasticities and the "average" rise in productivity, they seemed out of place in an analysis primarily concerned with relative productivity and relative wage changes.

Nevertheless, I now agree with Mr. Peters that their omission on these grounds was an error of judgment in an article which clearly possessed implications of a policy nature, and I hope to rectify the

¹ Another way of illustrating the importance of the income effect is to point out that on the basis of the numerical values used a policy of increasing wages sector by sector in accordance with productivity *would* be appropriate if labour were sufficiently immobile. For if relative prices remained the same, the increase of $1\frac{1}{2}$ per cent. in income would cause an increase of $3\frac{1}{2}$ per cent. in demand for *A*-goods and of $\frac{5}{6}$ per cent. in demand for *B*-goods. Labour requirements would therefore increase in *A* by $\frac{1}{2}$ per cent. and decrease in *B* by $\frac{1}{2}$ per cent. If the elasticity of labour mobility were as low as $\frac{1}{2}$ an increase of 3 per cent. in *A*-wages and of 1 per cent. in *B*-wages would just produce the transfer of labour needed to meet these requirements. Of course, the higher the degree of labour mobility the more nearly uniform must be the wage increases throughout the economy, for any given set of assumptions about the way in which the demands for the products of the different sectors are determined.

omission in this brief note, which can be considered as an amendment sheet to my original article.

Since the income effects are independent of the relative productivity and wage changes, they can be considered as exogenous to my original model. Let y_a and y_b be the proportional changes in the demand for the two goods which result from the income effects alone. Then equation (9) in my original article becomes

$$z_a - z_b = s[(x_a - x_b) - (w_a - w_b)] + (y_a - y_b) \dots\dots\dots (9')$$

After working through the consequent changes in equation (10), we obtain the modified form of the original wage-productivity equation (12) as

$$\frac{w_a - w_b}{x_a - x_b} = \frac{s-1}{s+m} + \frac{1}{s+m} \cdot \frac{y_a - y_b}{x_a - x_b} \dots\dots\dots (12')$$

The right-hand side defines E' , the structural elasticity of the system with income effects included, and can be inserted in place of E wherever the latter appears in the subsequent part of the original analysis. From a comparison of (12') with the original (12), it is obvious that E , E' differ only by the second term on the right of (12'). This is positive when the greater income elasticity and the greater productivity change occur in the same sector (so that $y_a - y_b$ and $x_a - x_b$ are both positive or both negative), and in this case—which Mr. Peters considers, with reason, an important one— E' will be algebraically greater than E . If the greater income elasticity occurs in the sector with the lesser productivity increase, then E' will tend to be less than E . In both cases, E , E' converge as s increases, and have the same upper limit, unity, when s becomes infinite.

This last fact disposes of Mr. Peters' doubts about my statement that sectorwise adjustment of wages to productivity would not be an appropriate policy: this still remains true, irrespective of the income elasticities, so long as the products of the two sectors are not perfect substitutes in consumption.

Indeed, insertion of the income effects does not change the general outlines of what was said originally; it merely causes a modification to the numerical values of the various parameters at which different policies become appropriate. One such modification is that the range of values of the parameters for which the more rapidly advancing sector should suffer a fall in wages is reduced, provided that that sector also has the higher income elasticity. On a rough judgment of fact, this would seem to reduce the likely incidence of a particularly difficult policy decision.

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A Further Note on Revealed Preference

By PETER NEWMAN

1. Dr. Green's recent paper¹ carried forward the application of relational algebra to the theory of revealed preference in a very stimulating way. His main conclusion was "the dethronement of the Strong Axiom" (p. 323) and its replacement by an alternative "gearing" axiom which "seems to have a better claim than [the Strong Axiom] to be regarded as the central proposition of the theory of consumer's behaviour" (p. 321). I shall argue here that this conclusion is false; there is no need for—nor likelihood of—a usurpation of the Strong Axiom's sovereignty.²

2. The difficulties in Dr. Green's paper occur essentially in his statement that certain postulates (in particular Green's P8 and P9) are *implicit* in Houthakker's demonstration.³ This is not true; Houthakker *proves* these postulates, which together assert that for any given batch x^0 , and for any Engel curve, say l^n , on which x^0 does not lie, there exists a unique batch x^n such that x^0 is not indirectly revealed preferred to x^n , nor x^n indirectly revealed preferred to x^0 . Further, this batch is a boundary between points "better" (in the *rp* sense) than x^0 , and points "worse" than x^0 . In order to prove this result it is necessary to assume the Strong Axiom. Houthakker is misleading in implying that the Strong Axiom is needed only to prove that the equivalence relation E of revealed preference is transitive. It is needed logically long before that, in order to show that the limit curve is a true boundary curve *and* that its points x are such that x^0Ex . Hence if Dr. Green assumes P8 and P9 he implicitly assumes the Strong Axiom. Once it is shown that batches connected by E actually exist, it is easy to show that E is transitive, without using the Strong Axiom directly at all.

¹ H. A. John Green: "Some Logical Relations in Revealed Preference Theory", *Economica*, XXIV, 1957, pp. 315–23. I am indebted to Dr. Green for his comments on earlier drafts of this note.

² Perhaps this is a convenient place to acknowledge the correctness of Houthakker's criticisms ("Mr. Newman on Revealed Preference", *Oxford Economic Papers*, 9, 1957, p. 234) of a paper of mine ("The Foundations of Revealed Preference Theory", *O.E.P.*, 7, 1955, pp. 151–69). For good measure I would add that my Theorem 2 and the proof (though not the result) of Theorem 7, which escape Houthakker's strictures, are also false, though this fact does not affect any of the rest of the paper.

Soon after my paper appeared I received criticisms similar to Houthakker's from Robert Solow and from Hugh Rose. Mr. Rose developed his points into a reconstruction of my axiom system (which has now appeared in *L'Industria*, 1957) which showed that if the relation Q defined below were substituted for the R relation that I used, exact analogues of my (incorrect) theorems were valid. In particular, there was no need for my gearing axiom; in this note I have similarly tried to show that there is no need for Green's gearing axiom, which can easily be derived as a result of the required axiom system. I owe a great deal to Mr. Rose for innumerable conversations and much correspondence; several of the points made here are as much his as mine, though the responsibility of course lies with me.

³ H. S. Houthakker: "Revealed Preference and the Utility Function", *Economica*, XVII, 1950, pp. 159–74.

3. The justification for these assertions is given in a forthcoming paper, but I shall here sketch an argument which shows that the Strong Axiom is needed to prove that the limit curve is a true boundary curve. I shall leave for the paper mentioned a full treatment of this, and of the other important problem, that of showing that points along a limit curve are such that $x^0 Ex$. First we define Samuelson's revealed preference relation R . We say that a batch x^0 bought at prices p^0 is directly revealed preferred to a different batch x^1 if $p^0 \cdot x^0 \geq p^0 \cdot x^1$, and write $x^0 Rx^1$. This definition was later broadened by Houthakker to the following form: x^0 is *indirectly* revealed preferred to a batch x^1 (written $x^0 Qx^1$) if there exists at least one finite sequence of batches $y^1, y^2, \dots, y^k, \dots, y^n$ (with $n \geq k > 0$) such that $x^0 Ry^1 Ry^2, \dots, y^n Rx^1$.

The relation Q is obviously transitive, and Mr. Rose has shown that if the commodity space is convex and the Weak Axiom assumed, then R implies Q . We define the equivalence relation E by: $x^0 Ex^1$ if and only if not $x^0 Qx^1$ and not $x^1 Qx^0$. E is equally obviously a symmetric relation.

4. It is interesting to see how far one can go using Samuelson's Weak Axiom alone, which reads: if $x^0 Rx^1$ then not $x^1 Rx^0$. Now it was Houthakker's main analytical contribution to define a special type of price-sequence and to show how useful it was. He obtained such a sequence as follows:

Let x^0 be a given batch, bought at p^0 , and let l^n be *any* Engel curve not containing x^0 , corresponding to a price set p^n . Now vary price sets "between" p^0 and p^n by varying a single parameter t , i.e. $p_i^t = p_i^0 + t(p_i^n - p_i^0)$, where t varies between 0 and 1. By taking an ordered finite sequence of values of t (including 0 and 1) and with $t_{k+1} > t_k$ we obtain a finite sequence of batches $z^{t_1}, z^{t_2}, \dots, z^{t_k}, \dots$ whose typical member is defined by the relation

$$\sum_i p_i^t z_i^{t+1} = \sum_i p_i^t z_i^t \quad \text{for } t+1 > t, \dots \dots (1)$$

Actually Houthakker defines two types of sequence, superior and inferior income sequences. The sequence defined by (1) is an inferior sequence, but since an inferior sequence from a batch x^0 to a batch x^1 is a superior sequence from x^1 to x^0 , we lose nothing by considering only inferior sequences. If x^0 and x^1 are connected by an inferior sequence, we shall write $x^0 Tx^1$. Houthakker shows that if $x^0 Tx^1$, then $x^0 Qx^1$, and further shows how to find points y^{nr} and z^{nr} on any given Engel curve l^n , and for any given number r of values of t , such that $y^{nr} Tx^0 Tz^{nr}$. It may be shown, by applying the Weak Axiom, that $p^n \cdot y^{nr} \geq p^n \cdot z^{nr}$ for any number r common to y^{nr} and z^{nr} .

5. Houthakker proved (using various continuity conditions, which may be substantially weakened) that as the number r of values of t tends to infinity, then the superior and inferior income sequences from x^0 to a given Engel curve l^n converge uniformly to a unique, continuous limit curve through x^0 . It may easily be shown that all points y lying

above this limit curve are such that yQx^0 , and all points z lying below it such that x^0Qz . So that, in a sense, the limit curve is a boundary curve. Let us write, if x^n lies on the limit curve through x^0 , that x^nNx^0 . On any Engel curve l^n there will exist a unique x^n such that x^nNx^0 , and it is possible to approximate as close as we please to x^n , from above by a superior income sequence from x^0 , and from below by an inferior income sequence from x^0 .

6. If a batch z lies below the limit curve, then we have seen that x^0Qz . Can we also have zQx^0 ? This is indeed a possibility if the Strong Axiom is not assumed. The result of paragraph 5 shows that, as r tends to infinity, the superior income sequences (SIS) will tend to a limit curve. But it does not prove that this convergence is monotonic downward, meaning by this that as r increases, the SIS for $(r + 1)$ will lie below the SIS for r . That this property of monotonicity does not hold may easily be shown by a numerical example (see the forthcoming paper mentioned). If it does not hold, then the terminal batch y^{r*} on l^n may overshoot the limit batch x^n and sink below it, for some value r^* of r , only to rise above x^n again for some value r^{**} of r , with $r^{**} > r^*$. (Similar considerations hold for the inferior income sequences.)

7. Suppose there did exist a y^{nr} such that $y^{nr}Tx^0$, with y^{nr} lying below x^n on the Engel curve l^n . Then there will exist a batch z^n lower than x^n and higher than y^{nr} on l^n such that x^0Tz^n . Then we have $x^0Tz^nRy^{nr}Tx^0$ which yields $x^0Qz^nQy^{nr}Qx^0$, giving x^0Qx^0 . The Weak Axiom cannot rule this out, so we have to adopt an axiom explicitly doing so, i.e. we assume that *not* x^0Qx^0 (equivalently, x^0Ex^0). This axiom is easily shown to be equivalent to the Strong Axiom, which we are therefore forced to assume in order to make the limit curve a true boundary curve. The reader may verify that Dr. Green's gearing axiom cannot cope with this problem.¹

8. It is necessary to prove further that if x^0Nx^n , then x^0Ex^n . It may be shown that in order to do this it is also necessary to adopt the Strong Axiom, so that points connected by E actually exist. The proof that E is transitive (it is symmetric by definition, while the Strong Axiom makes it reflexive) follows easily without direct use of the Strong Axiom. A complete ordering is thus established by the extended revealed preference relation and a continuous function may always be chosen to represent it, since the equivalence curves are unique and continuous. Whether one chooses to identify such an ordering by revealed preference as an ordering by *ordinal* preference is a matter of taste; there is no logical necessity to do so.²

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¹ On the face of it, this "gearing" axiom sounds implausible. Translated into words, it says that if there exists a Q sequence from x to y , and if there does *not* exist a Q sequence from y to z (nor from z to y) then there *does* exist a Q sequence from x to z . The proposition is in fact true (given the Strong Axiom) but it looks neither transparent nor convincing as a *primary* axiom.

² Cf. I. M. D. Little: *A Critique of Welfare Economics*, 2nd ed., Oxford, p. 289.

The Rehabilitation of Classical Debt Theory¹

By ALAN T. PEACOCK

I

An encouraging feature of post-war developments in economic theory has been the gradual blurring of the distinction between Classical and Keynesian economics. In the discussion of problems in the theory of public finance, however, the distinction is still more marked than perhaps it should be, no doubt because of the strong temptation of writers on the subject to take up different political positions. Moreover, the contribution of continental writers on the theory of public expenditure and public debt in a full employment economy has largely been ignored in Anglo-Saxon countries, and in consequence the essentially Keynesian element in public finance, the theory of fiscal policy, has dominated recent textbooks.² Professor James Buchanan has been one of the relatively few economists who have attempted to understand and to interpret continental developments in the subject, and the particular contribution under review is invaluable if for no other reason than for his discussion of French and Italian writing on public debt theory. We shall argue in this review that Professor Buchanan has fought for the rehabilitation of Classical debt theory on a rather narrow front and has in doing so by-passed discussion of some of the important issues in debt policy; but it may be said that he has stimulating things to say.

Buchanan is concerned mainly with the question—who bears the burden of the public debt? Briefly stated, Keynesian public debt theorists have argued that future generations do not bear the burden of any debt contracted now, because receivers of interest payments and borrowers (i.e. tax-payers) are the same community. If anyone bears the burden it is those who currently sacrifice present command over resources by lending to the government. It follows that the analogy between public and private debt is a false one and, furthermore, that the position of the individual debtor is similar to that of a nation only in so far as it borrows from abroad. All these propositions are rejected by Buchanan. We shall first of all summarise and illustrate his argument and then offer some comments on it.

¹ Review article of J. M. Buchanan's *The Public Principles of Public Debt: A Defence and Restatement*, Richard D. Irwin Inc., Homewood, Illinois. 1958. xi, 223 pp. \$5.

² On this point see R. A. Musgrave and A. T. Peacock (editors), *Classics in the Theory of Public Finance*, 1958, Introduction. On the later public debt controversy, see Buchanan, *op. cit.*, ch. 8.

II

Buchanan begins with a discussion on methodology. It is not always clear what sort of comparison is being made when one speaks of an additional burden imposed by an increase in national debt. Some writers, notably Professor Meade,¹ have made a comparison between a "debt" and a "no debt" situation. In criticising Lerner's argument that the national debt imposes no burden, Meade compares two communities "otherwise identical" except that one has a public debt and the other has none. In both communities $P \equiv Y_f + R_d - T_d$, where P is personal income after tax, Y_f is national income at factor cost, R_d debt interest payments and T_d the amount of direct taxation necessary to finance R_d . In Community I, R_d and T_d are both zero, so that personal income is the same before and after tax. In Community II, R_d and T_d are not zero but equal (provided we ignore administrative costs of debt management), so that personal income after tax is obviously less than personal income before tax. Thus in Community II, the rate of direct taxation depends on the amount of debt contracted, and, the larger the debt interest payments relative to personal income, the higher the rate. To Meade, therefore, the burden of the debt depends on the effects of the required taxation on personal incentives and on risk-taking. Continuous deficit spending, therefore, has "undesirable" side effects.

Buchanan has a good point in his argument that this approach contains an ambiguity in the meaning of the expression "communities otherwise identical". It could be argued that to be "otherwise identical" each community should have the same level of government expenditure in each period, and that one should compare a situation where the finance of this expenditure is carried out wholly by taxation in Community I and wholly or partly by the issue of debt in Community II. One would, therefore, have to compare the disincentive effects of current financing of identical expenditures with those of debt financing involving future tax burdens. Meade's definition of identity is, therefore, arbitrary.

There is an interesting parallel here to the examination of the incidence of taxes in a general equilibrium setting. We cannot determine the burden of the debt any more than we can determine the incidence of, say, a general sales tax or income tax, without reference to compensating budgetary changes. For a given level of government expenditure per period, an increase in borrowing to finance it implies a reduction in taxation and thus a reduction in current burdens, in Meade's sense. This is the "differential" case. Meade's case is the "absolute" case where, given no change in tax yields, an increase in borrowing implies a change in the level of government expenditure

¹ J. E. Meade, "Mr. Lerner on 'The Economics of Control'," *Economic Journal*, April, 1945, pp. 47-70 and also his "Is the National Debt a Burden?", *Oxford Economic Papers*, vol. X, no. 2, June 1958, pp. 163-83.

(or in the size of the budget surplus). It is, therefore, only one of a number of possible cases. Even then he must further assume that the increase in government expenditure financed by debt issues does not violate his further assumption of no change in real incomes in both communities.

A second point of methodology is that a clear distinction must be made between an initial situation of full employment and one of underemployment. It is certainly true that Keynesians have either not made the distinction or have concentrated attention solely on borrowing as a means of financing deficit spending.¹

A third point concerns definitions. It is often stated or implied in modern debt theory that the lender to the government makes a "sacrifice". Other than in situations where he is forced to hold government bonds, as in Russia, this is manifestly untrue. The lender substitutes at the margin between cash, goods and interest-bearing obligations, including government debt. "If an individual freely chooses to purchase a government bond, he is, presumably, moving to a preferred position on his utility surface by so doing. He has improved, not worsened, his lot by the transaction." This survival of the "pain-cost" doctrine in debt theory, Buchanan holds, bedevils the whole discussion of the burden problem.

With these points in mind, we can now state Buchanan's main thesis. Let us begin with a full employment situation, and assume that the government borrows in order to finance an increase in "non-productive" expenditure, that is to say, we are dealing with an "absolute" budgetary change. When the loan is contracted and before interest payments are made, there would be no change in the net worth of taxpayers-borrowers, i.e. of the community, or of lenders. The tax burdens of the former are not increased, and the latter are not being coerced into holding debt, but voluntarily adjust their asset holdings according to their preference patterns. However, in the future, in any period when interest accrues and is financed by taxation, the net worth of lenders *qua* lenders is unaltered, *but the net worth of taxpayers must be lower than it would have been had the debt not been contracted*, because of the obligation to meet the tax burden. Future generations, therefore, do face a burden. It is conceivable that taxpayers would write down the value of their expected (and now reduced) income streams at the time of borrowing and adjust their behaviour as if they had suffered a decline in wealth; then, as Ricardo suggested,² the burden would be transferred backwards in time. However, there are two objections to this qualification of the analysis. It cannot apply in cases where individuals own no assets or in the case where the sons

¹ One important writer well known for his exposition of Keynesian fiscal policy is an exception in this respect; see R. A. Musgrave, "Theorie der öffentlichen Schuld," *Handbuch der Finanzwissenschaft*, zweite Auflage, Band III., pp. 71-77, and also his *Theory of Public Finance* (1959).

² See David Ricardo, *Principles of Political Economy*, pp. 244-45 (*The Works and Correspondence of David Ricardo*, vol. I, ed. by Piero Sraffa, Cambridge, 1951).

and grandsons of the original taxpayers are required to pay the annual interest charge.

The argument is not affected by changing the initial assumption so that the debt-financed expenditure is "productive", in the sense that it raises future real incomes to a higher level than would otherwise have taken place; the net burden may be reduced, but the primary gross burden in the form of tax-financed interest payments remains distinct and is the same as in the previous case. However, this is not to say there are not other side effects, such as the effects of government borrowing on price levels and interest rates, which may have to be considered, although, as we shall see, Buchanan argues that these effects can either be ignored or that the changes they produce are irrelevant to his thesis.

Now let us consider a less-than-full-employment situation. This is perhaps the one which Keynesians have concentrated on. Even if one gets the methodology correct and considers either the differential or absolute budget change, much of the Keynesian analysis is irrelevant for there need be no debt creation in the usual sense at all. Expenditure could be financed by the printing press. There is, therefore, no burden because there need be no cost other than the purely nominal cost of note printing and issue.

Some further subtle points in Buchanan's analysis cannot be dealt with here. It should be noted in passing that his analysis of debt burdens implies that there is no essential difference between external and internal borrowing. He does not deny that there may be transfer difficulties in the case of foreign loans; but the difficulty or ease of transfer associated to-day with dollar shortages, for example, represents quite distinct problems.

III

The first comment on this analysis relates to the meaning of "burden" and "sacrifice", using them in the restricted sense which Professor Buchanan employs. Professor Buchanan in this book and elsewhere makes much of the fact that in "an individualistic society which governs itself through the use of democratic political forms, the idea of the 'group' or the 'whole' as a sentient being is contrary to the fundamental principle of social organisation . . . this being true, it is misleading to speak of group sacrifice or payment of benefit unless such aggregates can be broken down into component parts which may be conceptually or actually imputed to the individual or the family units in the group" (p. 36). However, Buchanan does not follow this point through to its logical conclusion. Such a voluntary theory of the state implies that taxpayers-cum-borrowers freely choose to finance government expenditure by loans as they would do in the case of private expenditure, and thus it could be argued that a voluntary decision of this sort implies no future burden on them. Of course, this argument does not hold good if those who pay taxes in the future

to finance interest payments have no part in the initial decision to borrow. It also raises doubts about the extent to which any democratic institutions can ever reflect individual choices in a form analogous to the expression of choices through the market as distinct from the political system. But Buchanan is right to stress "the absence of political sophistication on the part of those scholars who have been concerned with fiscal problems" (p. 36) which has led to the invention of such queer political animals as Pigou's "unitary being, with the government as its brain".¹

While the reviewer would agree with the contention that no sacrifice is imposed on the lender who voluntarily takes up government debt, given the kind of competitive market situation which Buchanan has in mind for his "Classical" model, it must be remembered that large public debts are generally contracted in war-time when the range of choice open to lenders is severely restricted and governments employ ingenious means to 'tailor' the debt structure. Buchanan is aware of this and, indeed, devotes a whole chapter (Chapter X) to the subject of War Borrowing. But it is fair to say that he is led to underestimate its importance because he seems to assume that the large increase in war borrowing represents purchases of bonds by commercial banks and not purchases by other financial institutions and by individuals. British economists with Keynes's post-war credits still to be paid will think in rather different terms! Even if Buchanan has American experience primarily in mind, his emphasis on borrowing from the banking system seems overdone.

So far we have interpreted the definitions of "burden of the debt" in a very narrow fashion as meaning the primary effects on the net worth of individuals. However, usually the term is applied in a rather wider and, it must be admitted, vaguer sense which takes into account the effects of debt creation on the incentives to work and save and on income distribution. Certainly Professor Buchanan is prepared to take some of these effects into account, but it is not certain what weight he attaches to them. In one particular case we shall now consider, he dismisses the problem of these "derived" burdens in a rather curious way.

Consider the case where a given level of "unproductive" expenditure is financed by debt creation, and where there is full employment. The extent to which such a situation will be inflationary as compared with one in which such expenditure is financed by taxation will depend on the effects of these two methods on the level of net saving. Let us assume that lenders to the government do not cut their consumption by the same amount as the increase in government expenditure. Then aggregate demand will increase and inflation will result. Buchanan agrees that "in so far as inflation occurs . . . , debt issue must place some burden on 'current' as opposed to future

¹ A. C. Pigou, *A Study in Public Finance* (third revised edition), 1947, p. 31.

generations" (p. 99). The burden, however, "is to be attributed to the *inflation* (Buchanan's italics) which is allowed to occur, not to the debt issue itself". Professor Buchanan attaches some importance to this argument for he amplifies it later in the chapter on War Borrowing mentioned above. Inflation is a form of taxation, argues Buchanan, so in so far as *inflation* occurs, the transfer of real resources from the private to the public sector is financed, not by real-debt issue alone, but also by taxation. We must get rid of the inflationary effect somehow before we have a correct "model", for only by so doing can we "separate real or pure debt from tax financing in the sharpest sense" (pp. 99-100). All this is like arguing that if you let a boy shatter your front window with a stone, the stone and not the boy causes the damage. You can choose to suffer the damage or you can prepare for the event by putting in unbreakable glass at extra cost just as you can offset the inflationary effect of debt issue by other fiscal operations. Either way you suffer a burden, but the burden is caused, surely, by letting the boy take a cock-shy in the first place! It seems odd that Professor Buchanan should try to minimise the effects of debt issue in this way, having previously insisted that one cannot analyse the creation of debt without examining the compensating changes in the rest of the budget. He is obviously right in insisting that the effects of debt increase must be compared with other methods of financing some given level of expenditure, but wrong to contend that *the consequences* of adopting public borrowing as the means of finance cannot be ascribed to the *decision* to borrow.

It would not be fair to judge Professor Buchanan's book by this curious argument; and it would be churlish not to end on a note of appreciation for this brave attempt to restore respect for the Classical tradition in the theory of public finance.

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Book Reviews

Policy Against Inflation. By R. F. HARROD. Macmillan & Co. Ltd. 1958.
xiv + 257 pp. 24s.

In this stimulating book, which arises out of evidence submitted to the Radcliffe Committee, Sir Roy Harrod bases a discussion of contemporary economic and monetary policies upon an analysis of developments over the last fifty years. His survey covers the pre-1914 gold standard, the managed currencies of the 1920's and 1930's, the new ideas introduced by Keynes (Sir Roy is clearly a Keynesian rather than a neo-Keynesian), the financial policies of the war-time and immediately post-war periods, the devaluation of 1949, the boom of 1953-54 and the renewed restrictionism of 1955, as well as the position as it appeared to him in 1957.

In so wide a discussion most authors would quickly provide evidence of their attachment to one or other of the groups into which political economists are to-day divided. Sir Roy, however, is exceptional in the way his views cut across the normal classifications, with the result that most, if not all, readers will find in his pages much to agree with and to admire but much also which arouses their strongest antagonisms. Which does which will, of course, vary from reader to reader. Those who agree with his views about the pre-eminence of maximum current output as an objective of policy, about the desirability of bringing the long-term rate of interest down to 3 per cent., or about the urgency of taking steps to re-expand demand in mid-1957, are unlikely to agree with his opinion that the devaluation of 1949 was probably unnecessary and certainly excessive, that stable exchange rates and convertibility are desirable in order to give foreigners confidence in sterling, and that the restrictive measures of 1955 were not only overdue but insufficiently severe—and vice-versa. Nevertheless, however much readers disagree with some of his conclusions, they will be forced by the well argued and often novel reasoning by which he supports them, not perhaps to change their own convictions, but at any rate to refurbish their justification for holding them.

While it is doubtful if Sir Roy has put forward any single proposition which will command universal acceptance, he seems almost certainly to have achieved the almost equally difficult task of making at least one proposal which will arouse universal opposition. This is his suggestion that nationalised industries should be relieved of the obligation to pay interest on their past debts and should then be obliged to raise their prices sufficiently to enable them to finance the whole of their capital programmes out of ploughed-back profits. Even if we accept Sir Roy's views about the difficulties which the need to find some £600m. of new capital a year for the nationalised industries imposes on the monetary and economic policies of the Government, and agree that it would be desirable for them to make some additional contribution out of profits, it is hard to believe that his suggestion that they should find the whole amount is seriously intended. Nationalised industries are liable to normal income and profits taxes, and Sir Roy's proposal would require them to obtain about £1,000m. a year increase in trading profits. Even if the increase in prices brought no fall in sales, this would mean an increase in prices of about one-third. Allowing for the

fall in sales, the necessary rise in electricity prices might be anything up to 50 per cent., while there is probably no price for railway services and coal which would bring the required increase. Even if the corporations were exempted from tax, electricity is probably the only industry from which the necessary increase in profits could be obtained. The attempt to obtain it would, however, relieve the Treasury in another way, for the resultant fall in demand would largely or wholly remove the corporations' need for new capital for expansion or for any other purpose. If this is Sir Roy's real purpose in making the suggestion, it is not one which is likely to find much support in any quarter.

F. W. PAISH.

Dream and Thought in the Business Community, 1860-1900. By E. C. KIRKLAND. Cornell University Press, Ithaca. Oxford University Press. 1956. ix + 175 pp. 24s.

The American Business System: A Historical Perspective, 1900-1955. By T. C. COCHRAN. Harvard University Press, Cambridge, Mass. Oxford University Press. 1958. viii + 227 pp. 38s.

Can the historian turn to business history and retain his integrity? Can he produce an "official" business history without becoming a "kept" writer? Many American (and British) historians would even today answer these questions in the negative. Businessmen cannot be studied objectively: the writer who is not against them must be for them. Accordingly, having the word "Business" in his title, Professor Kirkland feels obliged to offer an apology: "In launching this tiny ship on the storm-tossed waters of the era of the 'robber barons', I wish first to disclaim any intention of starting or joining a crusade for the rehabilitation of this group". But, Professor Kirkland has chosen his subject and must abide by the consequences. Despite his disclaimer—or perhaps because of it—his name has been linked with those of the "new conservatives", the "whitewashers", the "optimists who want to take the misery out of the Industrial Revolution".

The two works under review are essays by two of America's outstanding economic historians on the subject of American business. Together they span almost a century, meeting coincidentally in 1900. Both authors are trying to generalise in a field characterised by particularity and diversity. Kirkland is primarily concerned with individuals, behaviour and motives; Cochran primarily with organisation, institutions, and social and economic consequences. Though the two authors are asking different questions, the two works have sufficient in common to make for continuity when read in series. They both challenge the well-worn clichés associated with the subject. Both authors have produced books for the Required Reading lists.

Dream and Thought in the Business Community attempts to discover what American businessmen in the late 19th century thought, or thought they thought, or wanted others to think they thought, about certain specific matters. The evidence consists of the written and spoken statements, generally public but occasionally private, of businessmen themselves. The major areas of investigation are the attitudes towards economic activities *per se*, towards conspicuous consumption as symbolised in "The Big House", towards high school, university and technical education, towards government and towards philanthropy;

narrower topics, such as the Caribbean War or the tariff, enter the discussion from time to time.

Professor Kirkland suggests that failure is as revealing as success; the habit of studying only surviving enterprises diverts attention from the failures which have always been many times more numerous. He questions the view that businessmen relished depressions and even tried to induce them. Rockefeller wondered at one point "how we came through . . . All the fortune I have made has not served to compensate for the anxiety . . . Work by day and worry by night, week in and week out, month after month . . .". Kirkland finds that even in the so-called buccaneering decades, "the generation as a whole was more prone to seek security and reassurance than to welcome upheavals. Stability was its watchword". How misled we have been by the writing of business history "in terms of politics, Supreme Court discussions and briefs of learned counsel" when all the time the businessman was preoccupied, not with building empires, but with insuring against uncertainty and disaster, creating order out of confusion, replacing chaos and chance by calculation; yet too often the outcome of such rationalisation was a belief in, or the reality of, monopoly or near monopoly. If there was idealism, it sprang from a belief in the benefits of material progress: "Can there be any doubt", wrote Charles Elliott Perkins, "that cheapening the cost of necessities and conveniences of life is the most powerful agent of civilization and progress? . . . Poverty is the cause of most of the crime and misery in the world—cheapening the cost of necessities and conveniences of life is lessening poverty, and there is no other way to lessen it, absolutely none". It was implicit in this philosophy that, in a suffering world, a great producer of material goods mattered more than a great artist or scholar. The gospel of work remained a formidable motivating force and the active businessman sought to dissociate himself completely from the growing leisured class, drawing its income from stocks and bonds and abstaining from all distasteful labour; leisure and vice were still more or less synonymous. That the age of the organisation man had not yet arrived is suggested by Carnegie's definition of the business man as one who "plunges into and tosses upon the waves of human affairs without a life-preserver in the shape of a salary".

In each area examined, Kirkland's findings warn against the easy acceptance of the simplifications of folklore, against guesses as to what answer one would expect. Even on such an apparently straightforward question as the tariff there was far from unanimity among the leaders studied. If the business community remained suspicious of the politicians who formed governments, they welcomed the expert and non-partisan government commission and supported attempts to improve the organisation and efficiency of the civil service.

The American Business System may be regarded as a description of the outcome in the 20th century of these dreams and thoughts. Professor Cochran's book is a more ambitious project, not only because of its broader scope but also because of the much greater institutional and technological complexity of his period. He is not merely analysing the structure of business but also its relation to and effects upon society in general, as well as the reciprocal conditioning effects of that society upon the businessman. The "system" being discussed is static in scarcely any single respect, though Professor Cochran does find continuity in the business philosophy springing from the Puritan code of ethics and the frontier environment of the 19th century, in the beliefs that work is sacred, that ability brings reward, that tomorrow will be better than today, and that the system is to be judged only by its results, i.e. by its success or

failure in bringing about a higher standard of living measured largely in material terms. Cochran emphasises the word "American" in his title. He is concerned with the particular forces at work in the American environment, the social structure, political assumptions and pressures, the pattern of industries and attitudes to consumption, and not least the changes in all these respects induced by the technological changes of the 20th century. The last consideration, however, leads him to the paradox that it is broadly true that American corporations of today have of necessity—from the inescapable demands of technology—more in common with their institutionally different counterparts in the U.S.S.R. than they have with most American enterprises in the late 19th century. The rare asset of "gumption" might have been enough for the business leader of the 1880's, but with F. W. Taylor began the age when he had to be "trained right as well as born right"; research and technology have become as important to the corporation as administration and salesmanship. The greater productivity of the economy, measured by the growing number of mouths fed by one farmer, the growing number of bodies clothed by one textile worker, has not only changed the structure of society through the release of labour for tertiary employment, but has at the same time changed the pattern of consumption and thus of production itself: the economic "prizes" of the 19th century were big houses, fine furniture and good horses, none of which was produced by big business; the prizes of the 20th century, automobiles, electrical household equipment, home entertainments, are typical products of large corporations. But the demon of the soulless corporation was to some extent being exorcised. Increasingly the profits which ideally were maximised were very long-run; in the short run, steady, moderate profits were preferred to spectacular gains. Among the many consequences of the rise of the large corporations in the 20th century, the trend towards an organisational career has marked "a notable departure from historic American conditions and conflicted with a good deal of the nation's cultural heritage". In the bureaucracy of industry, Parkinson's Law has set in; somewhere in the middle of the hierarchy is to be found the "high-priced office boy, the routine administrator, who neither makes the decisions nor carries them out". Yet despite all, American businessmen have not succeeded in epitomising America as did the yeoman farmer of the 19th century agrarian mythology. To drive home his point, Professor Cochran in two different chapters quotes a Roper Poll of May 1949: "A majority of the people . . . believe that very few businessmen have the good of the nation in mind when they make their important decisions".

Professor Cochran's account of the repercussions of two major innovations which became important in his period, electrical power and the automobile, takes him far away from economics. He notices, for example, the replacement of the one-room, one-teacher school by the consolidated town school as a direct result of the introduction in the 1920's of the school bus. In a thoughtful survey of banking developments, he reaches the provocative conclusion that in the early years of the century the Morgan group was in fact performing many of the central banking functions which the federal government—thanks still to the economic consequences of Andy Jackson—failed to provide; in 1913, J. P. Morgan died and the Federal Reserve Act was passed.

One has to remark, regrettably, that Professor Cochran's book bears signs of apparent hasty completion. There are unexplained inconsistencies, infelicitous expressions ("the widespread frenzy for easy profits literally pulled itself along by its own bootstraps"), bad proof reading and careless choice of dates; on page 122 there is a wholly unjustified juxtaposition of two out-of-context

quotations. But these are blemishes which have to be forgiven in a work which is so ambitious in conception, so comprehensive in scope and so stimulating in achievement.

J. POTTER.

The Theory of Economic Growth. By W. A. LEWIS. George Allen & Unwin Ltd. 1955. 453 pp. 30s.

This review should begin with an apology for its lateness. Fortunately, the *Theory of Economic Growth* is a book that needs no bush. The delay has the minor advantage that it is possible to view this book against the considerable number of volumes on the same or kindred subjects that have appeared since its publication. It may safely be said that it retains a pre-eminent position.

The Theory of Economic Growth is an ambitious work—an attempt to build an understanding of the processes and causes of economic growth. It ranges over a diversity of topics: man's attitude to work and initiative, the main-springs of the advance of technological knowledge, the accumulation of capital, the causes and impact of population growth, and so forth. It covers the world, discussing the problems of growth in countries both rich and poor. The result is always interesting and illuminating. There is no paucity of ideas; and the pertinent fact is always there to point the conclusion. But at times it is also somewhat frustrating. We have long lists of factors that certainly must have some bearing on economic growth. But are they all of equal importance? Indeed, have they all to be present and favourable for economic development to occur? In Chapter IV, for example, we have some discussion about the conditions for the growth of knowledge. The questing mind is said to flourish best where religion is competitive; where political and economic power is widely diffused and liberally exercised; where scholars are accorded a high status; and so on. But must all these factors be favourable? Or will various combinations of favourable and unfavourable forces all be conducive to the growth of knowledge? The same problem arises over and over again. The fault, of course, is not Professor Lewis's. It is inherent in a subject so vast and kaleidoscopic.

Indeed it is the great strength of this book that, unlike so much else written on this subject, it does not seek that will-o'-the-wisp, the cause of growth. It is in fact instructive to take some current ideas on the problems of underdeveloped countries and to consider them in the light of parts of Professor Lewis's discussion. Thus those who trace the low savings of underdeveloped countries to an international demonstration effect would do well to consider his analysis of the crucial part played by contact and communication in developing material wants, which are the first prerequisite for the growth of effort and initiative. Likewise, does the evidence of a lack of entrepreneurship in underdeveloped countries really demonstrate anything of the sort? Or does it merely reflect the limitations imposed by lack of skills, particularly of management, and of capital? "It is not often that a new idea fits into an old technology without at the same time requiring a range of other changes of skills, or of capital formation, in order to accommodate itself" (p. 178). Or, to take a third idea, it is sometimes argued that the mechanism of international trade is such as automatically to widen the gap between rich and poor countries. This may happen; but, as Professor Lewis notes, there is also the theory that "a country which becomes prominent in international trade automatically behaves in ways which cause it to lose its leadership in due course" (p. 345). It

is, as he adds, "unsafe to make simple generalizations about the effects of increasing productivity in our nation upon all other nations, for these effects are very numerous" (p. 348).

This, however, is not to suggest that the last word has been written. Chapter V, for example, contains, *inter alia*, Professor Lewis's well-known theory that the proportion of national income saved depends not on the level of income per head, nor on its distribution between different income levels. Instead, the savings ratio is held to depend on the proportion of profits to national income, where profits are the income of capitalists devoted to capital formation. There is an element of tautology in the analysis, but it does point to the important fact that willingness to save is related to opportunities for profitable investment. It is more than likely that the poor savings performance of some under-developed countries results from a lack of such opportunities. To this extent Professor Lewis's analysis is a useful corrective to the general run of thought on this subject. But it may be questioned whether the ratio of profits, distributed and undistributed, to national income is the sole determinant in this matter. Undistributed profits may be linked directly to investment plans; but it is not at all obvious that the level of income and its distribution have nothing to do with the ease or difficulty of saving out of distributed profits. Certainly, Lewis's conclusions do not tally with those of Kuznets for the United States that the "saving-income proportion of individuals is the main determinant of the ratio of net savings to net product". (Universities-National Bureau Committee of Economic Research. *Capital Formation and Economic Growth*. 1955. p. 47.) An unequal income distribution is no guarantee of a high savings ratio where investment opportunities are lacking. But the mere existence of these opportunities is no guarantee either. The same problem of how social and political structures affect a country's saving capacity occurs in Professor Lewis's discussion of the ability of governments to raise resources for capital formation. He points to the success of Japan and Ghana in achieving a high marginal rate of tax. But how far was Japan's success in taxing her peasantry attributable to a social climate peculiar to that country? It is not at all obvious that the Japanese methods are applicable to, shall we say, India. Similarly, Ghana must presumably have been helped by the postwar increases in the price of cocoa which made possible both a high marginal tax and an increased real reward to the peasant for no additional effort. Some countries have been as favourably placed, but not all.

But while one may have doubts about some details of the analysis, there is no gainsaying the significance of this book.

A. D. KNOX.

Economic Backwardness and Economic Growth. By HARVEY LEIBENSTEIN.
John Wiley & Sons Inc., New York. Chapman & Hall. 1957.
xiv + 295 pp. 54s.

Two extreme views are currently canvassed respecting the development of backward areas. On the one hand there is the view that sustained development of their economies can be achieved only with a co-ordinated improvement of several aspects, economic and social, some of which can be expected to change only gradually and to have a perceptible impact only after a fair amount of time. On the other hand there are those who regard gradual growth as impossible because of counteracting forces at work to offset and nullify the forces of

growth. Policy implications follow. The first view is compatible with substantial reliance on internal resources whereas the second view involves inevitably large-scale external aid in one form or another. At this place we are not concerned in detail with these implications. In the related essays which make up the book under review the author attempts to provide a theoretical case for the second view. He regards the problem of development as one of breaking out of the various vicious circles which inhibit growth. He argues that the promotion of sustained growth—growth being measured in terms of output per head—requires an initial effort or series of initial efforts above a certain minimum size. This is so because underdeveloped economies are in states of quasi-equilibrium in which only some aspects of the system are stable. Small changes are reversed; only big changes can move the system to a new equilibrium. The Malthusian case might thus be said to be one of quasi-equilibrium with respect to average income, for when subsistence income is attained population becomes stationary. The author proceeds on the assumption that the initial state is that of Malthusian stationary equilibrium.

To promote sustained growth from that position a Critical Minimum Effort is required in order "to overcome internal diseconomies of scale due to indivisibilities, to overcome external diseconomies due to external interdependencies and achieve 'balanced' growth, to overcome income-depressing obstacles that may be generated by the stimulants to growth and, finally, to generate sufficient momentum in the system so that the factors that stimulate growth continue to play their part" (p. 106). Only then can the three growth-contributing activities come into action—the creation of entrepreneurship, the expansion of productive skills and the increase in productive knowledge. For these growth agents cannot operate at the subsistence level. They can come about only if per capita income exceeds subsistence level by a minimum margin and if there is already a minimum rate of growth of income.

This is the thesis worked out in these essays in what the author calls "a venture in the art of speculation". The speculation answers the essential test by being highly stimulating. Once we accept the state of quasi-equilibrium of the Malthusian case, the need for a sufficient jerk to bring the economy into a phase of sustainable growth follows. The force of the minimum jerk depends on the magnitudes of the variables involved and the period allowed for the transition. By enumerating the likely variables and suggesting sizes according to the period involved, the author might have achieved greater precision in his treatment of the Critical Minimum Effort. He is unnecessarily vague in saying "whatever we may mean by it, it is clear that the critical minimum effort is something that either directly or indirectly has a magnitude of some sort, part of which can usually be stated in terms of money value" (p. 105). Furthermore, the way out of the Malthusian stationariness might come, as Malthus himself suggested, through a new attitude to family size rather than to increased production. While the author does in an early essay apparently allow for this by including in the set of initial stocks of the system not only land, capital, inventories and labour but also "skills, technical knowledge, *mores*, traditions and goals" (p. 30), he later thinks wholly in terms of raising output by "a sufficiently large injection of investment from outside the economy" (p. 254). This seems to beg the question. Can any and every backward area be brought into the phase of sustainable growth by such a method without a whole horde of other changes? In other words, given the Malthusian case, the author appears to argue for a Critical Minimum Effort as necessary and then proceed as though

it were sufficient. It is not possible to follow him thus far. On the assumptions he makes a good case for part of the solution but treats it as the whole solution.

The author is aware of the partial nature of his theory in the sense that "certain aspects of the problem are not considered explicitly" (p. 5). As those neglected aspects include the monetary and banking aspects of the problem as well as the international trade aspects, the treatment is necessarily seriously incomplete. But the present reviewer thinks of it being partial in another sense. The Critical Minimum Effort is put forward as a *deus ex machina*. This version is unacceptable. Or its acceptance must go hand in hand with the acceptance of large-scale inflation as the price of leaving one set of vicious circles. But is the next set any better?

Even so, the speculation is stimulating. It might be improved at places with changes in method. Thus, to take one example, the author is anxious to measure entrepreneurship and suggests that it might be measured "in terms of the number of dollars that the entrepreneurial group could gather on the assumption of a given set of available investment opportunities". He goes on to admit that "actual estimates of this kind would, of course, be exceedingly difficult or nearly impossible to make, but, conceptually, it is a measurable notion." (p. 122). The reviewer would have preferred a definition in terms of the essential function performed—risk-taking. In the early stages of development at least there is unwillingness to undertake risk (hence the zero-sum activities which the author condemns). The purpose of tax concessions and incentive legislation is to reduce risk sufficiently to attract entrepreneurs. Such a definition would at one and the same time keep closely to traditional usage and contribute towards a discussion of how growth-factors can themselves be fostered.

D. J. MORGAN.

Canada's Economic Development, 1867-1953. By O. J. FIRESTONE. International Association for Research in Income and Wealth. Income and Wealth. Series VII. Bowes and Bowes. 1958. 410 pp. 45s.

Dr. O. J. Firestone is Economic Adviser to the Canadian Department of Trade and Commerce, and in this capacity has been responsible for valuable statistics on investment expenditure. He has had a similar official connection with the government's Central Mortgage and Housing Corporation, and has applied himself to statistical and qualitative measurement of the housing stock, its ownership and financing, and of such explanatory series as family formation. In 1953 he presented a first draft of the present study to the International Association for Research in Income and Wealth, undertaking to provide for Canada what Simon Kuznets and Raymond Goldsmith, in *Income and Wealth of the United States: Trends and Structure*, had done for the United States. Kuznets and Goldsmith, however, had the advantage of a proliferation of earlier attempts at measurement on which to build, some of it done by themselves, some by specialists at the National Bureau of Economic Research. Dr. Firestone, however, as Simon Kuznets remarks in a useful preface, had "no continuous series either for the aggregates or for the major breakdowns . . . for that long a period, nor has Canada's long-term growth been appraised previously within the framework of the national accounts".

Part I consists of a useful summary of the volume, emphasising changes and rates of growth over four selected spans: 1867-1890; 1890-1910; 1910-1930; 1930-1953; and the entire span 1867-1953. Part II, Analysis, runs for 200

pages. It contains a concentrated presentation of estimates, old and original, of the main economic aggregates since 1867.

Dr. Firestone's estimates suggest that since 1867 the real GNE per man-year has increased at a compound rate of 1.37 per cent., with the highest rates of increase being experienced at the turn of the century and in the recent twenty years. Population, on the other hand, has increased slightly less rapidly at some 1.67 per cent. compounded. The GNE has consequently increased at some 3.47 per cent. per year.

The chief reason for the population growth has been natural increase (*not* net migration); the chief reason for the increase in labour productivity is not determined by the author, but his use of space seems to indicate that he is impressed by the shift of the labour force into high-productivity industries.

The main framework for the statistical series is an extension into the past of the present official national accounts, which begin in 1926. Part III of the work contains information about Dr. Firestone's new estimates and their derivation. It is clear that for population information he has depended chiefly on the decennial censuses, augmented by fairly full information on immigration.

Information about expenditure also depends for the most part on census information. Twenty pages of text are taken to explain the translation of these product-flow data into purchase data by means of recent markup, inventory and expenditure ratios. Going over the estimates, one is impressed by the number of times later ratios were applied to earlier data. For example, the ratio of machinery and equipment produced by the iron and steel and transportation-equipment industries to that produced by all other industries was apparently assumed to be the same in 1870 as in 1920. The ratio of inventories to production in most manufacturing establishments was assumed to be the same in 1870 as in 1901. The values of ores used to produce refined metals were assumed to have the same ratio to the value of the refined metal in the nineteenth century as they had in 1910 and 1915 (though the metals exploited were certainly different). One does not wish to criticise Dr. Firestone's assumptions, for most of them appear to this inexperienced reviewer to be ingenious, credible and practical. However, there are so many of them that one fears that the whole *structure* of industry during the first world war has been extrapolated back into the nineteenth century. Indeed, since the National Accounts for 1926 contain many extrapolations back from the 1930's, and since the present estimates are welded to those for 1926, one fears that some of Dr. Firestone's detailed estimates of the structure of industry and population may actually be merely distorted reflections of later years.

When he comes to government outlays and foreign trade, Dr. Firestone is on much firmer ground, since relatively complete records exist. Some check on the size of the aggregate GNE in any period is provided by Dr. Firestone's calculation of aggregate GNP, using new estimates of value-added for the commodity industries. The difference between the two estimates is less than three per cent., a very close correspondence even when it is recalled that many of the same production estimates have been used in calculating components of both totals.

A final section of this part makes use of census measurements of "capital employed" in agriculture and manufacturing to estimate the real capital per worker in each industry over the whole span of years. There is no check available anywhere on the accuracy of this "capital employed" survey, nor indeed any very clear idea of what respondents to the annual surveys thought they were valuing. For this and other reasons the survey was abandoned in

1943 and it is unfortunate that Dr. Firestone should have given it even a minor role in his study, without at least submitting it to the kind of test performed on a similar series by Daniel Creamer in N.B.E.R. Occasional Paper 41.

The last Part of the work contains an interesting historical review of earlier non-official attempts to measure the national product and wealth, almost independent of the earlier Parts. The whole volume is a mine of information, well documented yet pointed and direct. It will be many years before Canadian economists have caught up to Dr. Firestone and revised his pioneering estimates. When they do, it is probable that they will have many corrections to make in the structure of the economy, but that, as Kuznets says in the introduction, "the revisions are bound to be largely those of addition and refinement, not of altering the major results".

ANTHONY SCOTT.

Malaya, A Political and Economic Appraisal. By LENNOX A. MILLS. University of Minnesota Press, Minneapolis. Oxford University Press. 1958. xi + 234 pp. 30s.

Professor Mills provides an admirable analysis of the events leading up to the grant of political independence to Malaya in 1957 and the parallel grant of internal self-government to the island of Singapore. He sketches briefly the earlier growth of a prosperous but two-sided community, on the one side Malay peasants and fishermen and on the other the more economically enterprising immigrant Chinese and Indians who were the mainstay of the rubber, tin and trading development. In a more detailed analysis of post-war events he brings out clearly that the movement towards political independence was not forced upon the British Government but rather provoked by it, as instanced by the considered announcement in December, 1943 by the Conservative Oliver Stanley (described in one of Professor Mills' rare slips as Lord Stanley), that "the main aim of the Government as regards the political future of Malaya after its liberation will be the development of its capacity for self-government within the Empire". He adds, justly enough, that the Colonial Office plan drawn up with this beneficent intention in fact stirred up a hornet's nest.

In his analysis of the subsequent complicated and rapidly changing events Professor Mills preserves a notable objectivity, recognising that the move towards national status was inevitable and proper without therefore being the solution to all problems. The course of events was complicated by active Communist intervention, by the bitter Malay reaction to the clumsy imposition of the first post-war constitution and by the increasing divergence between the mainland and the island of Singapore. After some storm and stress a stage has now been reached on the mainland not too different from the objectives of 1943, that is, a single government replacing the eleven different jurisdictions of pre-war days and emerging as an independent unit within the Commonwealth. This is due to the willingness so far of the effective leaders of the different racial groups to concentrate on the single issue of political independence, but Professor Mills clearly feels that the issues of inter-racial relations have only been temporarily put aside, not yet permanently solved.

The development of Singapore has gone less according to plan. Instead of Singapore and the mainland merging in some new political combination, they have diverged more and more, and owing to the great Chinese preponderance in Singapore appear unlikely to come together in the near future. Britain has failed to achieve any stable accommodation with the Singapore Chinese,

who tend towards sympathy if not ideological agreement with Communist China. To that failure past official policies have at least contributed. Until the last war the basic British attitude was to treat the Chinese as temporary sojourners, which, indeed, many of them were; to leave them free to prosper economically, but to make no consistent attempt to integrate them into the larger community of the British Commonwealth. Education was largely neglected or left to the Chinese community itself. A belated attempt to catch up after the war was overtaken by political developments which have placed democratic authority in the hands of a population still largely Chinese in tradition and education. A secondary but significant error of administration noted by Professor Mills was the abolition of the Secretariat for Chinese Affairs, which destroyed a valuable channel of communication with the Chinese community, perhaps with the idea that such a special channel would be unnecessary in a democratic society, but before it could be adequately replaced by the orthodox democratic channels for the expression of popular feeling. Today therefore, Singapore, very obviously, and the whole Malayan geographical unit rather less obviously, have still to resolve the basic problems of the integration of several disparate communities, of the creation of a genuine Malayan loyalty, and of political co-operation between Singapore and the mainland. There remains, too, the problem of defence; Professor Mills poses clearly the questions whether units of this size can in fact defend themselves but on the other hand whether they will in fact tolerate for long the presence of foreign defence forces. His study should leave any reader with a clear understanding of these problems and sympathy with those who have now to cope with them.

The economic analysis of the book is much less complete. Professor Mills concentrates on the problems of the rubber industry, especially the relation between natural and synthetic rubber, and the internal problem of the tax burden on the industry, imposed by programmes of social and economic development which inevitably bulk large in the eyes of the new independent governments. Possibly he is a little too pessimistic about the prospects of the natural rubber industry, which has shown considerable ability to withstand competition from its synthetic counterpart. Little is said about Malaya's other traditional economic stand-by, tin, and virtually nothing about other economic activities, including production of rice, and other local food crops, mining of lesser minerals, plantation agriculture and manufacturing. The last, indeed, is probably the really vital subject for any examination of Malaya's economic future, since the maintenance of a very rapidly increasing population at the present high standard of living is hardly likely to be possible on the basis of purely primary industry. There exist considerable resources of enterprise and natural skill, and potential sources of capital on which a development of manufacturing could be founded. On the other hand it would be very easy for inexperienced governments to stifle or frighten away the possible enterprise. On the economic side a large question mark hangs over the possibility of industrial growth, comparable with the question mark which hangs over the prospects of full integration on the political side.

SYDNEY CAINE.

Classics in the Theory of Public Finance. Edited by RICHARD A. MUSGRAVE and ALAN T. PEACOCK. International Economic Association. Macmillan & Co. Ltd. 1958. xx + 244 pp. 30s.

How does Welfare Economics cope with the Welfare State? All students of welfare economics have sooner or later to face this question, though many

manage to put it off for a surprisingly long time. Economists who take up public finance have to face it at the outset. And instinctively they look for a particular kind of answer: the answer which treats "the public sector" as in some sense an extension of "the private sector". The expenditure and revenue activities of Governments, like those of private enterprises, ought to be an expression of the preferences of the sovereign consumer. Government services are to be assimilated to sales over the counter. Taxes must be prices with a difference. The "benefit principle", to draw on the traditional language of public finance, should be the economist's key.

Of course, this does not mean that the economist in search of a theory of public finance entirely ignores "ability to pay". "Correcting" the distribution of income is an established part of public finance in practice and the welfare economists have been grateful to leave it there. But the makers of a pure theory of public finance hope that this part of the task can be treated as a separate issue. Stage One is to get the distribution of income "right"; Stage Two—the benefit principle.

Not all the papers which Professors Musgrave and Peacock have assembled and edited for this book are along these lines. Adolf Wagner (1883) and Lorenz von Stein (1885) each apply a historical approach to one half of the problem. Wagner makes public expenditure a matter of politics (and hence of political theory) and von Stein does the same for taxation. Both, moreover, emphasise the dynamic element of economic growth as a prime factor in setting the pace of, and limits to, state activity. Also represented is the self-styled "sociological approach" of Rudolf Goldscheid (1925), which aims at explaining (on Marxist lines) not what is desirable in public finance but what actually happens—a line which the editors rather hopefully describe as a beginning "towards an econometrics of fiscal politics". Lastly, normative again but on quite different lines, is the "Hegelian" theory of Hans Rietschl (1933), who denies that the collective wants supplied by the State are the wants of its individual citizens added together; they are the wants of the community as a corporate entity.

The remaining 12 "classics" in this collection, however, mark the evolution of the standard pattern indicated at the beginning of this review. And the admirable introductory essay by the editors, though it gives fair treatment to the other lines, is mainly concerned with the character of this evolution—in the more accessible English and American works as well as in these (mostly translated) papers.

Where does it get us? One sees in these papers the drawing out of the principle of ability to pay in marginal terms and its extension beyond taxation to the whole income. And one notes how the editors sum up the result: "an at best incomplete (and, if inter-personal utility comparisons are rejected: subjectively meaningless) answer to the problem". Likewise, one traces the development of the benefit principle through Wicksell to its "ultimate consequence" in Lindahl. The verdict of the editors is gentler here. They record that Lindahl, in reaching "the ultimate answer" in pure economic terms, has lost some of the realism of Wicksell and earlier writers. They note that even a theory of public finance based exclusively on individual preferences cannot, because of the essential compulsory element, escape "the political process of decision-making". But they would like to keep the door open and their commentary concludes with a hopeful hint of problems to be solved as "the newer welfare economics enters the picture".

Suppose that such a hope were justified and that a pure *economic* theory of public finance could be constructed from first premises. Is the effort justified? Having once admitted one aspect of politics, can one any longer treat all the other "factors of social and political reality" as mere disturbances, as does Lindahl? Reading some of these papers only confirms one's doubts. The term "silly-clever" has already been appropriated to another context; but "clever-silly" is still available and one is tempted to use it.

At least, this is one reader's experience. The real value of the benefit principle to the economist, like other "welfare propositions", it seems to me, is as a weapon of criticism, not as a complete and self-contained theory of policy. It enables us to ask awkward practical questions, such as why the state provides free education instead of seeing parents have the incomes to buy it for their children themselves; under what conditions should the government subsidise housing; whether public libraries are still, in 1958, a legitimate charge on the rates. Used in this limited way, the principle can be a powerful challenge to humbug. But elevated into a complete normative system, it loses all its advantages. It becomes sterile and ridiculous.

R. C. TRESS.

Labor Unions and Public Policy. By E. H. CHAMBERLIN, P. D. BRADLEY, G. D. REILLY and ROSCOE POUND. American Enterprise Association, Washington, D.C. 1958. 177 pp. \$4.50.

The burden of these studies is that the immense growth of trade unionism in the United States in the last quarter century, and the measures that have fostered it, have brought with them the possibility and fact of the abusive use of privileged power; and that this passes unrecognised for what it is only because of preconceptions formed when many wage-earners were miserably poor, and unionism was struggling to redress their inferiority in resources and status. Professor Chamberlin offers an economic analysis of trade union power. Professor Bradley attacks the argument that trade unions have a right to enforce membership because the "free rider" benefits by their achievements without paying his share of the expenses. Mr. Reilly examines the restriction by Federal laws and agencies of the powers of the states to regulate industrial relations. Dean Roscoe Pound surveys the history of various sorts of immunity before the law, as the setting of the present "immunities of labour unions and their members and officials to commit wrongs to persons and property, to interfere with the use of highways, to break contracts, to deprive individuals of the means of earning a livelihood, to control the activities of the individual workers and their local organisations by national organisations centrally and arbitrarily administered beyond the reach of state laws, and to misuse trust funds—things which no one else can do with impunity".

It is true that times have changed, and that powers and immunities pragmatically allowed to combinations of the weak and poor become potentially oppressive in the hands of the strong and prosperous. In Britain the courts have recently shown themselves ready to extend their protection of the individual against the vindictive use of trade union power. What more is done, here and elsewhere, probably depends not on general principles but on the extent of abuses that are brought to notice. Should these be considerable, then a review of public policy towards the unions seems possible in any country whose wage-earners now enjoy material prosperity and social security: subject

always to the concurrence of electors most of whom identify themselves with the typical union member.

Any such review would still have to consider the unions not only as bargaining agencies but as part of the industrial and social fabric and as an estate of the realm. It is still true that their members generally have lower incomes than most of the rest of the occupied population, do less satisfying work, and run more risk of unemployment. As such, they constitute an interest, with its necessary place in the system of social checks and balances, and its organic function in the body politic. Powers which would be merely abusive in a bargaining agency may be suited to what, in the widest sense, is an organ of government, providing for the communication of opinion, the balancing of pressures, and the ordering of conduct.

Even as bargaining agencies the unions seem to have made much less use of their monopoly power than might be expected. Professor Chamberlin argues that since the labour market is in practice so subdivided, most employers are something of monopsonists, so that the case for unions as a means of setting a sole seller of labour over against each sole buyer is overwhelming; but that when the bargaining front of the union extends beyond a single firm, the off-setting of monopsony goes over into the exertion of monopoly power. "Collective action by labourers on an 'industry-wide' basis," he says, "to raise their incomes at the expense of the rest of the economy is logically indistinguishable from the collective action by entrepreneurs for the same purpose which is forbidden by the anti-trust laws." For this and other reasons he concludes that "the public interest requires the imposition of major restrictions on the monopoly power of labour". But in dealing with product markets he reminds us how "monopoly and competition are both relative terms, and *all* monopolists are subject to competition in some degree": if the same holds of the labour market, that may be why his apprehension of the exploitation of the rest of the economy by the unions is offset by the evidence which Professor Bradley marshals to show that the "free rider" is not really riding at all, because unions have not in fact increased the share of labour in the national product, nor have wages risen more in the unionised sectors than elsewhere.

E. H. PHELPS BROWN.

The Economic Order. By PAUL T. HOMAN, ALBERT GAILORD HART and ARNOLD W. SAMETZ. Harcourt, Brace & Co., New York. 1958. xxiv + 839 pp. \$6.95.

The annual flood of elementary American textbooks may, in large part, be attributed to the widespread practice, in the universities, of introducing a subject through a course of lectures delivered three, or more, times a week for a couple of semesters. Detailed lecture notes are only too easily convertible into a book of respectable size; and it remains only for the writer to think of some long-standing need, revealed by his teaching experience over the years, which his new arrangement is carefully designed to fulfil. In the circumstances it is not surprising that a reviewer's attitude to yet another introductory text is one of resigned scepticism. After all, the beginner is admirably provided for with Hicks's *Social Framework*, with Benham's *Economics*, or Cairncross's *Introduction to Economics*, to mention a few elementary books that spring to mind, while the first-year specialist will have at his disposal, among other good things, Samuelson's *Economics*, Stigler's *Theory of Price*, Boulding's

Economic Analysis, along with several treatises on imperfect competition plus innumerable introductions to Keynes (not all of which are more difficult to understand than *The General Theory*). With such books amply provided on our library shelves it is no ordinary run-of-the-mill textbook which is able to elicit a grunt of approval from the reviewer. This work does so, however. It is a work which will enhance the reputations of the already distinguished authors, and deserves to be considered eligible in those cases where the first-year student can afford but one economics textbook.

The format is pleasing, the diagrams are clearly sketched and, by and large the theoretical treatment is lucid and unhurried. Perhaps in a future edition more detailed references to the works of other writers will be furnished to enable the serious reader to pursue his interests further.

Although in its formal techniques it is rather less ambitious than most of the textbooks mentioned above—it does not employ elementary calculus or algebra, or indifference curves or isoquants—it is more ambitious in coverage and in information about institutions. In regard to coverage, besides the treatment of demand and supply analysis, market forms, income determination and international trade, there are several chapters on public policy in Part IV, and on economic growth and capitalism versus socialism in Part VII, all of which are well worth reading even by the more advanced student. On these controversial questions the authors are open-minded enough and some of the more telling arguments for socialism are forcibly put. For instance, on page 765 they write: "It is all very well to talk of the way the capitalist economy responds to consumer wants, says the socialist; but how can the poor consumer think what he wants amid the din of sales promotion? Does he really want to 'keep up with the Joneses' at the expense of his digestion, his heart, his relations with his children, and his ability to savor enjoyments?" Nevertheless, one can perhaps detect a partiality for American capitalism in the trend of the argument which might have been less apparent, or more justifiable, if a clearer division were drawn between those propositions which derive from allocation economics and those which stem from social values or political philosophy. One must tread warily in such controversial terrain and it is a matter of precaution that one should keep to the forefront of the discussion a clear distinction between the inescapable properties of economic models and those features of contemporary economic systems whose origins lie embedded in history.

The distinctive attraction of this book, and one which will appeal to students impatient of abstraction, is its wealth of institutional fact and illustration. Part IV, in particular, is developed against a background of the recent history of the U.S., Part V, on income determination, outlines the growth of American financial institutions since the turn of the century, and Part VI that of international organisations in the post-war era.

As may be expected in a work of this size and coverage, not every one will be carried along by all of the arguments. And though for the most part, it will be conceded, the authors deal fairly with matters of controversy and interpretation, in one instance there seems to have been a lapse from their usual high standards. Chapter 22, devoted in the main to describing the tools of the "New Economics", starts off with some seriously inadequate remarks about the "Classical" view of aggregative economics. Now it is surely better to omit mention of previously held theories altogether than to present them in a light so jaundiced that the innocent reader must inevitably conclude that our intellectual forbears were purblind doctrinaires who obviously could not see the wood for the trees. Moreover, the chapter following this, which is an introduction

to the quantity theories of money, including the cash balances theory, makes no attempt to connect them with the Classical theory. While there can be, and are, different views on the chief features of the "Classical" theory of income and employment, a treatment which ignores the Cambridge, or cash balances, theory is surely quite unacceptable.

There are some other, minor, things one might complain of.

Although much is made of the importance of a good allocation of resources, the authors do not appear to venture beyond the notion of meeting consumers' choices at the lowest cost in terms of scarce resources. This is both too vague and too facile, as indeed the authors seem to realise in the latter and more controversial parts of the book.

Except for a footnote on page 294 there is no mention of quasi-rent, while the concept of rent itself *as an economic surplus* is not made explicit. Indeed, there is another weakness on the supply side of the analytic treatment: the discussion on factor-combination is decidedly flimsy.

On page 460, contrary to usage, the "accelerator effect" is taken as a relationship between the *level* of aggregate output and the level of investment.

There is a slip on page 459; the multiplier is there stated to be the reciprocal of the marginal propensity to *consume*.

Finally, a niggling point perhaps, the backward-sloping supply curve of labour is attributed on page 271 to a negative income elasticity: "...at some point an increase in income will reduce the amount of labour the household will supply". This is unsatisfactory on two counts. If the backward-sloping supply curve of labour has an elasticity of minus unity, the reduction in the amount of labour supplied cannot at all be attributed to an increase in income since, obviously, income remains constant. In these circumstances, it is more appropriate to talk of the *welfare* effect of a rise in the price of labour. Secondly, this welfare effect is not, strictly speaking, negative. Consistent with the accepted definition, a reduction in the amount of labour services supplied is equivalent to a buying back of labour (say, for leisure purposes)—an increased demand for leisure, so to speak. As such, the welfare effect is 'normal' and positive.

But these are minor blemishes. As such they do not mar the overall-excellence of a book which deserves a wide circulation.

E. J. MISHAN.

Dollar Shortage. By E. HOFFMEYER. Ejnar Munksgaard, Copenhagen. North Holland Publishing Company, Amsterdam. 1958. 232 pp.

For most of the post-war period the dollar shortage has dominated the discussion of international payments relationships. The improvement of the situation over the last few years, however, has reduced topical interest in this issue; the time has come, therefore, for an appraisal of the vast literature produced in the late forties and early fifties, and for a synthesis of the conflicting points of view then put forward. This is the central aim of Mr. Hoffmeyer's book.

The first four chapters are mainly devoted to an examination of the dollar problem itself, and to a survey of the various theories and explanations concerning the dollar shortage put forward by economists in the past. Mr. Hoffmeyer's account is always interesting and sometimes exceedingly illuminating, though not all of it appears to be valid—e.g. the tendency to belittle the quantitative significance of the dollar shortage.

The rest of the book puts forward the author's own analysis of the dollar problem, which is largely, as he himself admits, a synthesis of existing theories. In his view, the dollar problem is chiefly the outcome of the position of the U.S. as the chief innovating nation in the world. Because of her technological supremacy, the comparative cost advantage of the U.S. tends to lie with "new" products, which therefore form a large proportion of U.S. exports; the rest of the world, on the other hand, is best suited to produce "traditional" goods, and hence U.S. imports contain a substantial share of these older commodities. This difference in the composition of U.S. exports and imports leads to an important difference in the ease with which trade can be adjusted to offset any disequilibria. U.S. exports have a relatively free access to foreign markets, just because they are "new", whereas imports from the rest of the world have to compete with established U.S. industries which generally put up a determined and often successful resistance to the entry of foreign products. For these reasons, Mr. Hoffmeyer argues, market forces working towards the elimination of an American deficit will speedily lead to an expansion of U.S. exports, whereas the same forces will find it much more difficult to bring about an increase of American imports should the U.S. run a surplus. Hence there exists a tendency for the U.S. balance of payments to be in surplus, given continued random disturbances to trade between the U.S. and the rest of the world.

This, in brief summary, is Mr. Hoffmeyer's explanation of the dollar shortage. The various hypotheses are put forward partly in the form of a quasi-theoretical analysis, and partly on the basis of statistical arguments and of selected case studies. The conclusions point to the importance of a liberal commercial policy on the part of the U.S.

There is no doubt that Mr. Hoffmeyer's analysis can be criticised within the limits of his own assumptions, both on the formal and on the empirical levels. Also, his reasoning concerning the adjustment of the American balance of payments to random disturbances would appear to provide only a partial explanation. For example, it could well be argued as has been argued by several writers in the past, that the U.S. economy tends to suffer from recessions rather more frequently and deeply than other economies, and that the dollar problem has been due to an important extent—though not wholly—to the effects of such recessions upon the external balance.

Mr. Hoffmeyer cannot therefore claim to have furnished us with a complete explanation of the dollar shortage. However, he has pinpointed some important determinants, and has thus made a useful contribution to the study of this wide and intricate issue.

H. H. LIESNER.

The Kress Library of Business and Economics: Catalogue, 1777-1817.
Baker Library, Harvard Graduate School of Business Administration,
Boston. Bailey Bros. & Swinfen. 1957. vii + 397 pp. 80s.

This new volume of the Kress Library catalogue, bringing us up to 1817, continues the bibliographical coverage of materials relating to economic thought and practice which was begun with the original catalogue (published in 1940) and its supplement (1955). The Kress Library is one of the largest collections of early economic literature and its catalogue, containing so far nearly 17,000 items to be found there and in other Harvard Libraries, is the best single bibliographical source at our disposal. Yet the compilers

will be the first to recognise that with all its wealth the Kress collection covers only a fraction—albeit probably a substantial one—of the total literature. Of the mountain of pamphlets on economic subjects brought forth by the French Revolution we find only a slice, and the German literature of the period is badly represented, due no doubt to the interests of Professor Foxwell whose collection forms the basis of the Kress Library.

All this should not detract from the great value of the bibliography as a work of reference. Entries are arranged chronologically, and in alphabetical order within each year. It thus avoids the pitfalls of subject classification which we find in the Higgs bibliography. American works are distinguished by current numbers printed in boldface. Brief notes give references to other editions, alleged authors, elucidations of contents where this is not clear from the title, and other bibliographical information. There is also a full combined author and title index.

It is much to be hoped that the proposed final volume, covering the period 1818–1848, will be achieved.

W. L. GUTTSMAN.

SHORTER NOTICES

International Economics. By JACK N. BEHRMAN and WILSON E. SCHMIDT. Rinehart & Co. Inc., New York. 1957. x + 561 pp. \$6.50.

This is one of the better textbooks on international economics which have appeared in recent years. The authors have resisted the temptation to place undue emphasis on applied aspects, and have not only given an adequate and balanced treatment of conventional theoretical topics, but have also managed to include some of the more recent analytical material, though their account is still too brief to give the student more than an impression of the issues involved. The discussion of applied subjects is remarkable both for a detailed description of U.S. foreign aid and for the absence of any mention of recent attempts to achieve a partial freeing of trade in Western Europe.

Nationalökonomie. By E. BÖHLER. Polygraphischer Verlag AG, Zürich. 1957. 296 pp.

This is a good all-round textbook, written mostly for newcomers to the subject. After two introductory chapters dealing with the nature of economics and the organisation of the economy, there is a long section on the determination of the national income (in which the author adopts Keynesian reasoning), on the role of money, and on international trade. This is followed by two chapters on price theory. A short review of economic fluctuations concludes the work. The author has tried throughout to avoid unnecessarily abstract formulations and to link theory to facts.

Economic Influences on the South African Frontier, 1652–1836. By S. DANIEL NEUMARK. Stanford University Press, Stanford. Oxford University Press. 1957. xiii + 196 pp. 40s.

Mr. Neumark is concerned with the economic forces behind the outward movement of the eastern and northern frontiers of the Cape of Good Hope and the Great Trek of the 1830's. He marshals and analyses a considerable

body of material to show that the frontier communities were not primitive and self-sufficient, and not based entirely on agriculture; and he stresses the importance of their access to markets. The volume is a useful addition to the scanty literature on the economic history of South Africa.

The National Economic Accounts of the United States: Review, Appraisal and Recommendations. NATIONAL BUREAU OF ECONOMIC RESEARCH INC., NEW YORK. 1958. 202 pp. 65c.

This is a historical review of estimates of national income in the United States, together with suggestions for their improvement. It is agreed that the continued decentralisation of the collection of data should be continued but that the summaries and presentation should be integrated. Tables are included, based on 1953, to show how the present five segments of income accounts, input-output tables, flow of funds statements, balance of payments statements and national balance-sheets could be co-ordinated. Estimates in terms freed from the influences of changes in prices should be prepared more frequently and in greater detail than at present. It was noted that users of national accounts asked for quarterly estimates of gross national product at constant prices more frequently than for anything else. An input-output table should be prepared for the year 1958 because the latest currently available relates to 1947.

Theoretical discussions are a pleasing feature of the report. Among the subjects dealt with are the treatment of consumers' durables as capital, realised capital gains and losses, interest payments on government debt, valuation of services provided by the government and capital consumption.

The Moral Basis of a Backward Society. By EDWARD C. BANFIELD. The Free Press, Glencoe, Illinois. 1958. 204 pp.

In its author's words, this book "is about a single village in Southern Italy, the extreme backwardness and poverty of which is to be explained largely (but not entirely) by the inability of the villagers to act together for their common good, or indeed, for any end transcending the immediate, material interest of the nuclear family". It contains much interesting information and comment on conditions in a particular underdeveloped "area", though opinions will differ as to whether the author has successfully established his main thesis.

The Inflationary Spiral. By CHANG KIA-NGAU. John Wiley & Sons Inc., New York. Chapman & Hall Ltd. 1958. xvii + 394 pp. 80s.

This work provides an authoritative study of the monetary history of China from the outbreak of the Sino-Japanese war in 1937 to the Communist victory in 1949. The author is a former Governor of the Bank of China and of the Central Bank of China, and is now teaching in the United States. He provides a thorough account of the course and causes of the runaway inflation which was one of the main factors responsible for the overthrow of the Nationalist Government. He draws from this some sensible lessons for other underdeveloped countries faced with a similar situation.

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